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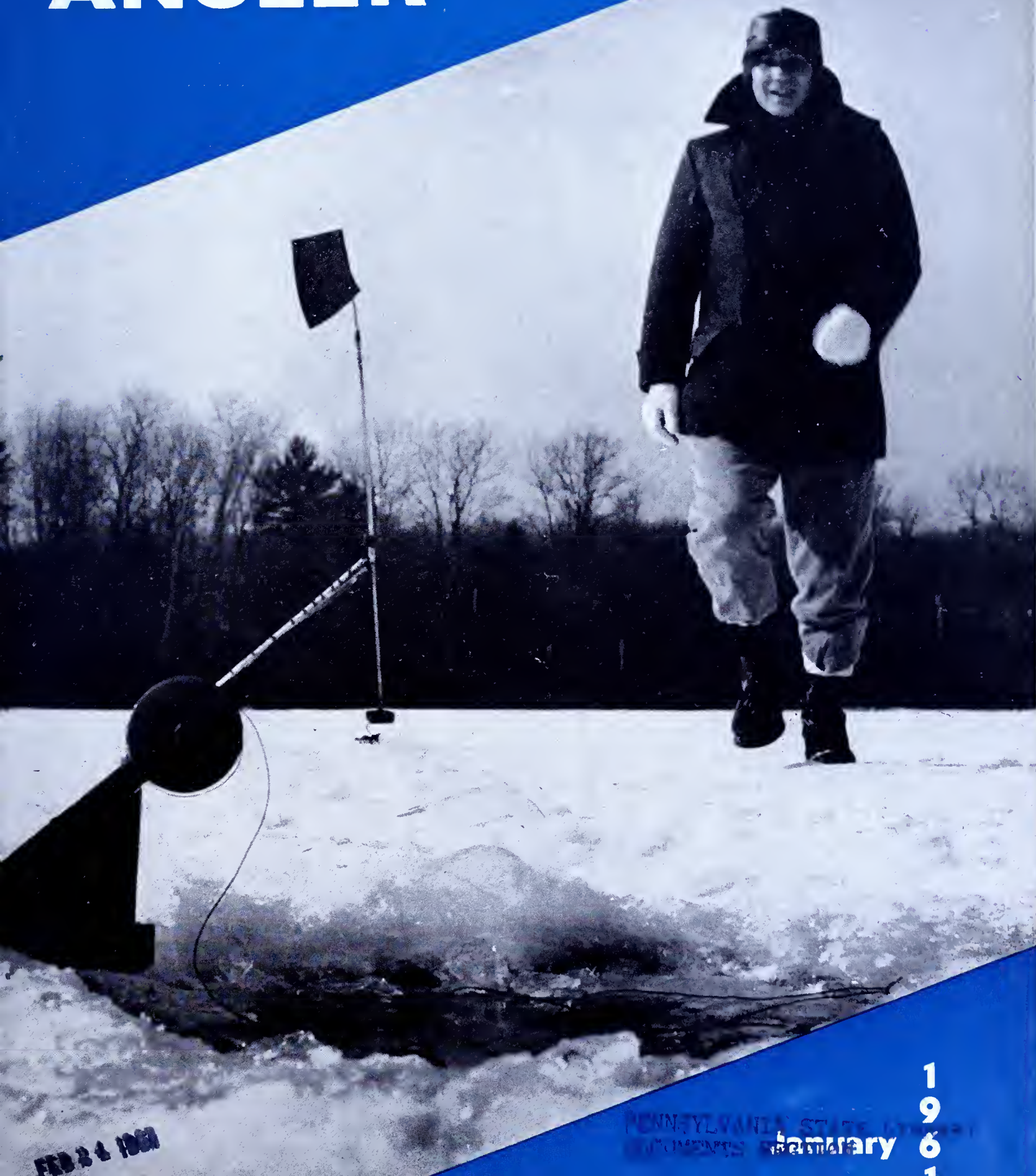
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January

1961

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JANUARY, 1961

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JOHNNY NICKLAS, Photographer

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Don Shiner photo

Back Cover—Art by John Taylor

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The **Sturgeon** *in Pennsylvania*

BY C. ROBERT GLOVER

Part I

With the possible exception of the shark and the recently discovered coelacanth the sturgeon reaches farther back into time on earth in its present or near present form than any other complex animal known to exist today.

It predates the lungfishes by possibly 200 million years, the garfishes by possibly 150 million years. It predates the era when plant life first appeared on the land by possibly 100 million years.

Its line goes back into the earth's history to the Devonian Age, the Age Of Fishes, which geologists have fixed to have extended through a period between 280 million and 25 million years ago.

It survived the Mississippian and Pennsylvanian periods, 30 million to 280 million years ago, when plant life laid down the mantle that became the earth's coal fields. Then the Permian Age, 205 million to 230 million years ago, and the great upheavals of that Age that altered the face of the earth by bringing into existence the Primeval mountain ranges; when the inland waters receded; when the

glaciers alternately marched and retreated across the land, and when greater temperature extremes took place than in any period, except the present.

It swam its way through the Mesozoic Age, the Age Of Reptiles, 75 million to 280 million years ago, when races of giant vertebrates were the earth's tyrants on land, sea and air. With equal persistence it spanned six Epochs of the Cenozoic Age into the Recent Epoch, that of Man.

Through those eons of time the sturgeon survived vicissitudes beyond comprehension—nature at its cruellest and most violent, only to be decimated to a point of near extinction in some parts of the world at the hands of the man creature.

This focuses attention from all of Time to a fantastically small segment of the ¼ million years man is deemed to have existed on earth and from a view of the entire world to a small part of it. That part being our state of Pennsylvania—more specifically the parts that border Lake Erie, the Ohio River, and very likely the lower reaches

LAKE STURGEON landed by Ralph Fisheries of Erie. This specimen measured over 6 feet in length and weighed 200 pounds. Fish of this size are now rarely caught. Note the projectile mouth, which is well adapted for sucking up food organisms from lake bottom. Photo by Charles Schmidt.



of its two main tributaries, the Allegheny and the Monongahela Rivers, and the Susquehanna and the Delaware Rivers. The time can be pinpointed, to a 20 year period just prior to 1900.

Though throughout the northern hemisphere there are some 20 known species of sturgeon; only four are concerned in our waters. Sturgeon do not occur in the tropics or southern hemisphere. And though the largest species, found in Russia, is said to reach 30 feet, species which enter the North American continent from the Atlantic have been recorded to lengths of 18 feet; from the Pacific, 12 feet. It is not unusual for the exclusively fresh water species to run to 6 feet.

A common characteristic of all species of sturgeon, however, is the elongated body, fairly rounded in girth and tapering to the head and tail end. Also common are long snouts, with barbels or feelers ahead of the mouth, which is on the lower side of the head. The mouth is furnished with a very protractile roundish tube, having powerful muscles. It can be extended into the mud and retracted in its process of feeding. All have longitudinal series of bony plates with nodules between them on the body, instead of scales; fins without spines; ventral fins far back; a small dorsal fin, and an anal fin beneath it, farther back near the tail. The vertebral column and the upper lobe of the tail fin bends upwards and is longer than the lower lobe.

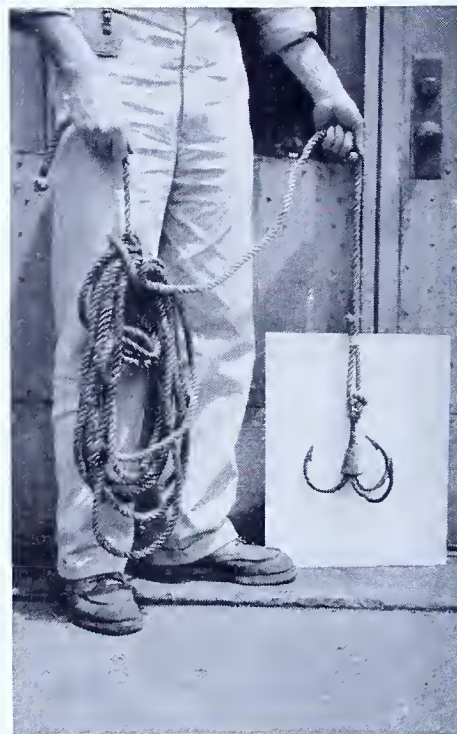
Early in the summer the ocean species of adult sturgeon migrate into the fresh water rivers for breeding purposes. The fresh water species move toward the shoals and shores to spawn. The eggs are small and numerous, and hatch in approximately 6 days. The growth of the young is rapid.

An interesting observation is that the young are more heavily armored in relation to size than are the adults. Some authorities point out that this is a throw-back to their Primeval ancestors. It is also one possible explanation of why the family has survived down through the eons of time.

In writing about the sturgeon in his "Creatures Of Other Days" in 1892, Rev. H. P. Hutchinson stated, "Concerning its long pedigree we ought to look upon this fish with great veneration. There are indeed few fishes which can boast of such an ancestry, though it has not retained its full primitive form. Its armor, one of the characteristics of the Ganoid fishes, has almost entirely disappeared, there being but a few plates down the back. Its eusp-like teeth are also gone."

In this same regard, a bulletin published by the United States Fish Commission in 1890 contained the following: "While the adult sturgeon does not possess the full armor its ancestors developed in the Reptilian Age, curiously enough the young are better provided. But as they approach maturity the plates gradually disappear. The advantage of the markedly rougher armature of the young in the struggle for existence is obvious, as it adapts the young less convenient of delugation or mastication by the more ravenous predacious forms inhabiting the same waters."

Though the young grow rapidly, it is about 20 years before they reach sexual maturity. Some attain great age. Observations made in Russia indicate the species common there attains an age of between 200 and 300 years. A ripe old age of those of the lakes on the North American con-



STURGEON HOOK. According to commercial fishermen on Lake Erie this device was used in hooking sturgeon there. It was dragged along the bottom, behind a row boat, where sturgeon were known to be. When a heavy "object" was encountered, the hook was set. Many objects other than sturgeon were caught. Photo by Al Larsen.

continent is held at about 50 years.

The four distinct species of the sturgeon family still present in relatively small numbers in Pennsylvania waters are the Lake Sturgeon (*Acipenser fulvescens*), the Atlantic Sturgeon (*Acipenser oxyrinchus*), the Shovel-nosed Sturgeon (*Scaphirhynchus platyorychus*), and the Short-nosed Sturgeon (*Acipenser brevirostrum*).

The Lake Sturgeon variously known as Ohio River sturgeon, rock sturgeon, bony sturgeon, red sturgeon and ruddy sturgeon, inhabits the Mississippi, Ohio, Allegheny Rivers and the Great Lakes. It is smaller than its marine cousin, the average adult being about 5 feet and weighs about 100 pounds. Its food and that of all sturgeons is made up chiefly of shellfish—fresh water snails and clams, crayfish, aquatic insect larvae, small amount of fish and aquatic vegetation. Eggs of fishes also might be found in stomachs.

The Atlantic Sturgeon, sometimes referred to as the common sturgeon and sharp-nosed sturgeon, ranges as far north along the North American continent as Cape Cod. It is this species that moves into the waters of the lower Susquehanna and Delaware Rivers. Reports around the turn of the century have placed the sturgeon on rare occasions as far up the Delaware River as Port Jervis.

The Shovel-nosed Sturgeon is distinguished from the other sturgeons by the absence of blow holes and by the complete armature of the tail with bony plates. The tail is depressed, wider than deep. The snout is depressed actually triangular in shape and in the form of a spade. Sometimes called the white sturgeon, it is found in the Ohio and Mississippi Valleys, extending to the upper Missouri and to the Rio Grande. In the large tributaries of the Ohio, in western Pennsylvania, the species was



LOSE-UP of a head of a Lake Sturgeon. Note barbels or feelers, which enable the fish to feel its way along the bottom and "sense" food. You can put your own caption to this in relation to what this fellow is saying to photographer Johnny Nicklas. Our's is, "I keep telling you fella, thith ith'nt my better thide."



REAR PORTION of the same sturgeon. The vertebral column extends into the upper lobe of the tail.

common. Its maximum length is 8 feet. It has never been accepted as an important food fish.

The Short-nosed Sturgeon is the least common and least known of those frequenting Pennsylvania waters. It was only ever positively identified in the Delaware River. The largest specimen known was 33 inches long. Individuals 60 inches long were known to be capable of re-producing. Its feeding habits are the same as the other species.

Of the four, only the Lake Sturgeon and the Atlantic Sturgeon were ever commercially important. Their flesh, fresh or smoked, constituted an important part of the diet of many people in the years prior to 1900. Its roe becomes caviar, always considered a delicacy by many and always relatively costly. Its air bladder was used to produce singlass.

The eggs and flesh of the fish were by no means all that eventually became utilized. There was scarcely any part of it which was not of value and put to some use in some parts of the world. On the west coast, the Italians eagerly purchased the main intestine and from it made an article which resembled tripe. The Chinese there were fond of the gills, from which they made an excellent soup. They also made a soup out of the marrow found in the backbone. The fishermen themselves made rope of enormous strength out of the skin.

All parts of the head, hide and backbone not otherwise used were boiled and a fine oil extracted, which was very valuable for tanners' purposes.

Earlier, the Indians used the bones of the sturgeon and their plate scales for rasps and graters.

Early in this period, which started in the middle 1800's, only a portion of the fishes caught were utilized for food. As the supply exceeded the demand in this regard, some were used for fertilizer, some were rendered for oil, some became hog feed, many were allowed to rot. But the waste started before that. Because of their size, they inflicted great damage to fishing gear set for other species. Fishermen not yet aware of their potential value, therefore, wantonly slaughtered them.

The extensive exploitation of the sturgeon during the late 1800's is blamed largely for the destruction of the fishery. However, as has been the case with other of our wildlife resources, dams and pollution became additional deterrents. Dams barred the sturgeon from many of their earlier spawning grounds. Meanwhile, pollution—municipal, industrial and siltation—not only took its toll of fish and destroyed spawning grounds but virtually wiped out the organisms which constituted the food supply of the species.

Efforts to bolster the population by artificial propagation, a goal of fish culturists for half a century, have proved unavailing. The main problem has been the inability to secure ripe males and females at the same time.

During the period when the sturgeon was developing into an important industry in Lake Erie and the Delaware and Susquehanna Rivers, the fish were taken in several ways. Though netting was most extensively employed other methods included set lines, spearing and grappling.

To Be Continued



GREAT WINTER SPORT . . . jigging for perch through the ice.

The Age and Growth of the **YELLOW PERCH** in Pennsylvania

■ The yellow perch is a fish that is synonymous with ice fishing. Not that they aren't caught in the other seasons of the year, but winter is the time the yellow perch comes into its own. Tip-up fishermen all over the Commonwealth spend many cold hours angling for this delectable morsel. The yellow perch cannot be over exploited. Heavy catches through the ice are not detrimental, but rather an aid, even if slight, to the well being and growth of this species and other associated species.

When predator populations are low, the yellow perch population stunts and plays havoc with the reproduction of other species. Consequently, there is little left to fish for in lakes with predominantly yellow perch populations. Lake Jean in Sullivan and Luzerne Counties was an example of yellow perch stunting, before it was chemically reclaimed. Almost half of the 1,500,000 in the lake were yellow perch. Most of the other half was made up of small bullheads. The young of predatory fish such as pickerel were significantly lacking. As would be expected, the yellow perch averaged less than a half ounce in weight and were approximately three inches long.

The world's record yellow perch is reputed to have weighed 4 pounds, 3½ ounces, but no length is given.

If you want to check how close yours is to a world's record, below is a length-weight relationship chart to help you to determine approximate lengths.

<i>Length in Inches</i>	<i>Weight in Ounces</i>
4	0.7
6	2.0
8	4.5
10	8.5
11	11.0
12	15.5
13	18.0
14	19.5
15	25.5

Table I shows the relative growth of yellow perch in twelve northeastern Pennsylvania lakes. Ages up to thirteen years were recorded but there were not enough specimens to justify their inclusion in this table.

It may come as a shock to many people to find out just how slowly yellow perch grow in our northeastern lakes. To help them grow a little faster why not spend a few days this winter on the ice. It's a healthy sport, lots of fun and the perch are delicious.

PART IV

JACK MILLER and KEEN BUSS

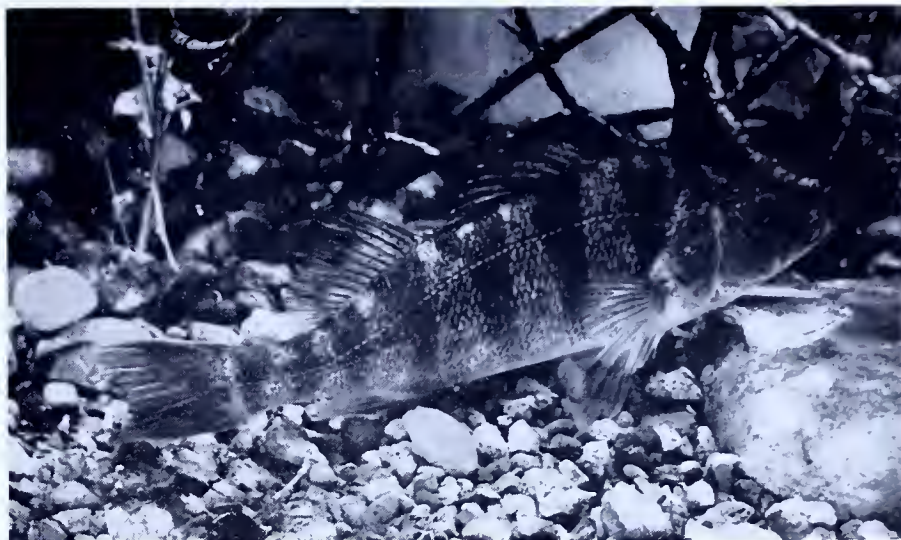
Fishery Biologists

Benner Spring Fish Research Station

Pennsylvania Fish Commission

Johnny Nicklas photos

Pennsylvania Fish Commission



THE YELLOW PERCH can breed itself out of food and growth.

TABLE I

Growth of Yellow Perch in Twelve
Northeastern Pennsylvania Lakes

Average Back Calculated Sizes
AGE

Lake and County	Number of Specimens	I	II	III	IV	V	VI	VII	VIII
Peck's Pond Pike County	16	2.6	4.7	6.4	8.1	9.3	9.7		
Bristol Pond Bucks County	6	1.9	3.5	5.0	6.3	6.9			
Lake Idlewild Susquehanna County	41	2.0	3.9	5.3	6.8	8.3			
Quaker Lake Susquehanna County	11	2.3	5.4	7.8	8.9				
Lake Winola Wyoming County	38	1.6	5.0	7.3	9.1	10.2			
Tingley Lake Susquehanna County	40	1.8	3.7	5.9	7.4	8.6	9.6	9.8	10.6
Greeley Lake Pike County	11	1.7	3.1	4.7					
Lake Lorain Wayne County	12	2.4	3.9	4.7	5.4				
Brady's Lake Monroe County	19	1.7	3.2	5.1	6.5	7.9	9.2	11.0	
North Jersey Lake Wayne and Monroe Counties	13	1.7	3.1	4.6	6.0	7.4	8.4	9.6	10.1
Duck Harbor Pond Wayne County	23	1.3	2.6	4.0	5.5	6.9	8.0	8.8	9.8
Upper Woods Pond Wayne County	48	2.8	5.6	7.4	9.0				
Average		2.0	4.0	5.7	7.2	8.2	9.0	9.8	10.2



—Allied Pix Photo

BOATING has many phases . . . here members of Harrisburg's Keystone Boating Club have fun slicing a big chunk of Susquehanna water. . . .

PANEL . . . *can Fisherman and Boatman co-exist on our crowded waters?*

. . . an open forum of opinions in which the right of free expression is recognized.

By CARL F. SHEPPARD

**Boating Editor
Philadelphia Evening and Sunday Bulletin**

Can the boatman and the fisherman co-exist? Of course they can. I've boated and fished for 47 years, and I'm still co-existing happily. Boating, however, is "exploding," and happy co-existence of boatmen and fishermen from here on will depend more and more upon skillfull admin-

istration of boating and fishing programs by experts in each field.

In Pennsylvania fishing, quite rightly, has its experts and its program, administered by its own independent state agency, the Fish Commission. So has hunting, which flourishes under its similarly specialized Game Commission.

But boating, which is more specialized than either hunting or fishing—is, indeed, more of a pastime and for some a way of life than a sport—has not received equal consideration. It has no independent agency to look after

manifold and mushrooming interests, no state experts, no state program. It hasn't even a voice in state activities. It has been brushed off as a side interest of the Fish Commission, which licenses motorboats on "inland" waters (in practice, all but the Delaware River and Lake Erie) and enforces certain restrictions through its fish wardens. The Coast Guard, a qualified boating agency which has earned the respect of skippers everywhere, has done the licensing and performed what services it could on Pennsylvania's Federal waters, which include portions of the Delaware River and Lake Erie.

In this unhappy situation the only substantial help boatmen have received has come from the Department of Forests and Waters, which built the state's first marina on Lake Erie and has ground for a second on the Delaware.

But now the Federal Boating Act of 1958 offers Pennsylvania an opportunity to correct this inequity, and give boating equal stature with hunting and fishing. In this is their hope of happy co-existence. Here's how it must be done:

By enacting legislation conforming to the Federal Act, Pennsylvania can take over the numbering of motorboats and other craft on all of its waters. The Federal Act requires licensing only of boats over 10 HP, but registration of other undocumented craft is possible voluntarily. The Coast Guard and responsible boating organizations are urging such universal registration for practical reasons of safety, ease of movement between states, and nationwide uniformity of regulations.

Pennsylvania's boating population cannot be accurately gauged until some such registration is in effect. There is no doubt, however, that sufficient funds would become available through small license fees to more than support an independent boating agency established as a bureau, board, or commission like the Navigation Commission, within the Department of Forests and Waters.

The boating agency would follow the now nationally-accepted concepts of promoting boating facilities and patrol services along with strong operator-education programs. It would devote all boating revenues to improvement of boating. Its waterway patrolmen would be qualified by on-the-water experience, and would encourage safe boating by example and helpfulness in the true boating tradition, rather than try to "enforce" safety by crackdowns.

The agency would be administered by an executive director and staff under direction of a board or commission of skippers representing the various state areas, appointed by the governor and serving four year terms. They would receive limited reimbursement for out-of-pocket expenses.

Boating agency programs would be co-ordinated with Fish Commission and Game Commission programs through a co-ordinating committee composed of delegates from each agency under chairmanship of the Secretary of the Department of Forests and Waters. Members of the legislature, the Army Engineers, and the Coast Guard could act in as consultants.

In this way land and water potentials can be developed to the best interests of all concerned, areas of friction can be reduced or eliminated, and the boatman, the fisherman, and the hunter, too, not only can co-exist on equal terms but can have fun doing it.

By **ALBERT M. DAY**

**Executive Director
Pennsylvania Fish Commission**

The growing masses of men, women and youngsters who use the public waters of the Commonwealth of Pennsylvania for fishing, boating, water skiing and other forms of outdoor recreation are in trouble! Too many humans are already competing for the limited surface acres of our lakes and streams and the situation will grow constantly worse. Of all, boating is one of the most popular, yet definitely the most poorly regulated form of public recreation in America today.

Never since Henry Ford invented his weird contraption called the "horseless buggy" has there been such a radical change in the mobility of our recreational public. Automobiles, of course, are now commonplace and our whole system is geared to new and better superhighways. Broad ribbons of cement lie across great earthen fills and burrow through holes in the mountains so that a restless public may pour across the continent from one end to the other.

The increase in highway traffic and the attendant improvement in accommodations for the millions of automobile users came gradually. Taxes and license fees on automotive equipment paralleled this growth. Registration and safety laws have been tightened and are strictly enforced. Most states require compulsory insurance to protect the lives and properties of people injured by careless drivers. Air travel in both public and private planes is rigidly controlled.

Not so with boats. Within a decade we have seen an emergence in recreational boating more phenomenal and spectacular than witnessed during any single like period of automotive history but with little thought given to safety or control.

It is estimated that we now have approximately one motor boat for every seven automobiles in the country, with our public waterways becoming equally as dangerous and often much more so than our highways.

Pennsylvania has over 40,000 miles of State Highways with more than 5 million licensed drivers, over 4 million motor vehicles, and about 67,000 registered motor boats. Yet on several weekends, normally the worst time for traffic accidents, more people lost their lives enjoying boating and other forms of water recreation than died on our highways.

Statistics can be boring, but they can also be startling. It is reliably estimated that out of our national population of some 180,000,000 people, 40,000,000 participated in recreational boating in 1959. Almost \$2,500,000,000 were spent retail in 1959 for new and used boats, motors, accessories, etc.

There are estimated to be 7,800,000 recreational boats in existence in all waters in the United States.

Outboard motors in use approach 5,000,000.

New units sold in 1959—540,000.

Boat trailers in use—1,750,000.

In 1947—3,790 boat trailers were sold; in 1959 or 12 years later 175,000.

Here in Pennsylvania in 1959—75,000 motors for boats were sold in Philadelphia and 35,000 in Pittsburgh.



ALL FISHERMAN asks . . . is for a quiet shoreline or two, undisturbed by churning boatmen, skiers and skin divers.

Recreational boating is big business in Pennsylvania, as it is elsewhere throughout the United States. Yet, we have unusual problems which are magnified by the density of our population and the limited water areas available to our citizens. Pennsylvania stands third in the nation's population, yet only 32nd in size. Compress the ever growing numbers of fun seeking, recreation minded week-enders on our limited waters and the problem intensifies. It is high time that we look the situation squarely in the face and do what we can to prevent disaster.

When I say disaster—I mean exactly that! A quick glance through our recent motor boat accident files indicates what goes on all of the time on Pennsylvania waters.

On last June 18 on Harvey's Lake a speed boat operator crashed into a boat with two fishermen aboard and demolished their craft although fortunately no one was killed.

On July 26 also at Harvey's Lake a water skiing boat failed to see a fisherman's boat, hit it head on, demolished it, while the fisherman and his eight year old son suffered injuries which included a damaged right kidney, fractured right pelvis, lacerations and contusions.

On July 29, a racing speed boat with a 95 HP motor crashed into the side of a ferry, injuring the operator and passengers of the ferry.

On August 18 on the Schuylkill River a 14 ft. boat with a 40 HP motor overturned with four children and two adults. The father of three of the children was killed.

On August 26 on Conneaut Lake a hot-rod water cowboy took off in a 16 ft. boat in which he had installed a 215 HP Thunderbird engine. At 30 miles an hour skimming across the lake he struck the wake of another boat which had crossed his bow some distance ahead. His boat nosed over, the torque of the propellor flipped the craft and threw his six passengers sprawling into the lake. Only prompt rescue by other boaters averted disaster.

On August 27, the pilot of a water skiing boat on the Schuylkill River while following a 21 ft. Chris Craft which was also towing two water skiers, failed to notice that one of the skiers had fallen into the water. The operator heard a bump, looked back and saw that he had hit someone. They picked the victim from the water with his right arm severed above the elbow, and a skull fracture. Our latest report is that victim has recovered and is now looking forward to learning how to water ski with one arm.

Water accidents are infinite in variety and often unbelievable. On a small lake in Northern Michigan last year there was one survivor among thirteen people aboard a boat which capsized as the operator attempted to start its outboard motor. Those thirteen people were occupants of a boat just twelve feet long. Twelve foot boats normally are overloaded with four occupants.

Endlessly the story continues.

Concurrent with the phenomenal growth in motor boating has been a steady decline in the sale of fishing licenses in Pennsylvania. We reached a high in sales of 758,000 in 1953. It has gradually been going down hill since that time until last year sales amounted to around 650,000. Other factors are probably involved but there is no question that the competition for our public waters between the water skiers, speed boat enthusiasts and the fishermen has had a material influence on the decline in fishing interest.

For instance, national surveys show that about 14.7 million folks use boats for fishing and about 1.7 million for water skiing. This survey also shows that fishermen can get along nicely with one or two acres of water, but that a water skier requires a minimum of 200 acres in which to cavort. Thus, the water skier takes up 100 times as much area as a fisherman and in addition probably churns up the water and discourages fish from biting normally on even a larger acreage.

Not only do the fishermen have to put up with the competition from speeding boats and water skiers, but a new sport is threatening to take over many waters. I refer to the new cult of water enthusiasts known as "skin divers." A few of these fellows insist on using illegal spear guns to take big bass, walleyes and muskies, while others bob up around the boats of fishermen as they wait quietly for a bite and innocently inquire how the fishing may be! From some of the comments coming to me from those same fishermen, it is doubtful that the skin divers get a very civil response!!

All of these growing conflicts between different segments of our sport loving population for use of the limited bodies of public water which we have in the Commonwealth of Pennsylvania, point up the fact that we must do a better job of public administration if we are to avoid more serious and frustrating conflicts.

It was this very need emphasized and re-emphasized throughout the length and breadth of the United States that brought on the federal boating act of 1958 commonly known as the "Bonner Act." This legislation recognized the rapidly growing problem everywhere and attempted to do something about it. It took note of the fact that in many states no one needs a license to operate a small pleasure boat; that there is no minimum age for pleasure pilots; that navigation rules are unknown to many of the

country's 40 million boatmen; that regulatory authority is sparse or lacking in many of our public waters and that those safety regulations, buoys and guiding signs which do exist are all too frequently ignored and flouted. It was to meet this national emergency in outdoor recreation that the Bonner Act was passed.

Its aim is to at least keep track of and gather information and data about recreational boating and to encourage the individual states to go as far beyond the federal law as they wish to tighten the administration of this blooming pleasure industry.

Unfortunately, Pennsylvania's proposal for legislation considered by the last session of the Legislature and which would have accomplished many of the aims envisioned in the federal act, failed of passage. Pennsylvania is thus one of twelve states which does not yet have the benefits of such an act. We are still operating under a law last revised in 1931.

Since that time the Fish Commission with an officer force of 58 uniformed men and 244 special deputies has enforced the Pennsylvania boating law. In addition to these officers, seasonal deputies are employed to patrol many of the larger lakes and rivers from Memorial Day to and including Labor Day.

Realizing that a good officer is a well informed officer, the Fish Commission some two years ago instituted a training program relative to boats and their operation. With the aid of members of the U.S. Coast Guard Auxiliary and the U. S. Power Squadron as instructors, 80 per cent of the warden force has since completed this training. Presently the balance of the staff are receiving this instruction. The Commission will not be satisfied until each and every regular officer has received some type of special training in boat handling.

The complement of boats and motors at the officers disposal for law enforcement prior to 1960 was 32. Recently \$40,000 was spent for the purchase of boats, trailers, motors and other essential boating equipment. These included 19 additional boats and motors, 4 of which were inboards to be used on our larger waters such as Lake Erie and the rivers in western Pennsylvania.

During the year 1956—228 arrests were made for infractions of the Motorboat Laws. In 1960 arrests increased to 600. Yet, with the great increase in boating, the inadequacy of patrol enforcement and safety education, the Commission has been unable to do the kind of job that public safety demands. Any new legislation to qualify Pennsylvania under the provisions of the Bonner Act should emphasize the matter of adequate financing to provide for more effective patrol and a broad educational program.

Some argue that administration of this act should be in some other Department of State Government. A review of laws in other states shows that the great majority keep the administration of boating and fishing laws in the same department. In 39 states which now conform to the Bonner Act, 24 have boating administration as part of Fish, Game and Conservation Departments; 5 with Motor Vehicles and Highways; 4 with Parks and Recreation and 5 with separate agencies.

Some have suggested that the Department of Forests & Waters should take over the task. Dr. Maurice K. Goddard, Secretary of the Department of Forests and Waters,

publicly stated during the Izaak Walton League meeting at Oil City on October 9 that he felt that the Fish Commission with its widespread fleet of boats and automobiles and trained warden staff could perform more effectively than could the employees of Forests & Waters. He pointed out that the situation on the Delaware River is different than elsewhere in the Commonwealth and that the boating laws there should probably be handled by the Delaware River Navigation Commission for the tidal waters which are at present under the jurisdiction of that Commission.

Both the Federated Sportsmen's Clubs and the Izaak Walton League here in Pennsylvania within the past month have reiterated their confidence in the Fish Commission to do a satisfactory job.

Perhaps the most cogent reason for maintaining the administration of the nation's boating laws within the Fish, Game and Conservation Departments centers not around personnel and equipment, but rather around the broad basic philosophy of the most equitable use of our public waters. Certainly a single agency can come closer to dividing up the all-too-few available water areas among the fishermen, the skin divers, the speed boaters and the water skiers, than could two or more agencies. Through single administration it is easier to assign certain portions of lakes for certain days or hours of the day to the skiers who demand such a large portion of the water in comparison to the fishermen than would be possible if one agency were to be responsible for the boaters and another for the fishermen.

We have a good example right here in Pennsylvania. Last September the Fish Commission received a request that a regional water skiing carnival be permitted to use practically all of the waters of Conneaut Lake for a full week. We objected. They reduced their demands to four days and half the lake. We still objected. Finally agreement was reached to two days and about one-fourth of the lake.

The point is that had a separate State agency dedicated to boating alone been charged with this decision, the speed boat water skiers would probably have driven everyone else off the lake for a week. As it turned out, these public waters were shared by many thousands of our citizens instead of a mere handful, and the contest was still a successful affair.

A good example of the close relationship between water skiers and fishermen is found in another area much to the dissatisfaction of the latter. Access areas originally intended for fishermen to launch their boats on streams and lakes have in most part been taken over by pure boaters and water ski enthusiasts almost to the exclusion of fishing. Yet the money for the acquisition and construction of these areas and ramps came entirely from fishing funds.

During the last session of the Legislature, this whole question was given thorough consideration. Several different versions of a proposed law, known as H.B. 1178 came up for vigorous and sometimes heated debate. During that period a group now known as the Pennsylvania Pleasure Boating Association was organized, largely out of opposition to some of the proposals discussed by the Legislature.

According to their spokesman, they seek "an independent, self-supporting state boating agency, run by boat-

Outdoor and Boating Editor, The Baltimore Sun



SENIOR CITIZENS like both quiet fishing and leisurely boating, yet have nothing against speed boats, like to see other people enjoy the outdoors.

men for boatmen." They suggest that such an agency should be attached to the Department of Forests & Waters, rather than the Fish Commission, presumably to assure as wide separation between the boating interests and the fishing interests as possible. Such a proposal has been drafted after numerous conferences and discussions among the pleasure boating interests.

New legislation will undoubtedly be considered during the forthcoming session of the Legislature. It now appears that one bill with further revisions and refinements of much discussed and oft re-written H.B. 1178 will be introduced. Another written by the Pennsylvania Pleasure Boating Association will probably be presented.

The people of the great Commonwealth of Pennsylvania will therefore have an opportunity to decide whether our citizens—all of them who own and use our public waters shall have the pleasure boaters, the skin divers and the water skiers under the control of an agency set up to protect their special interests, and a separate agency given the responsibility of regulating the fishermen. All use our common waters.

To many, it would be just as reasonable to establish one agency to promote trucking and to look out for those interests, and another to control the actions of those who drive Volkswagens, Fords and Chevrolets. All must now abide by uniform rules and regulations. All use our common highways.

Regardless of the decision on who should administer the new law, our citizens deserve a better break than they are getting now. This new and mushrooming boating industry deserves administrative supervision comparable to that which years of experience have proven essential for other forms of transportation. Perhaps what we need is a new look and a new concept of administration to meet the situation which is now emerging.

The prime question: Can fisherman and boatman co-exist on our crowded waters? The answer: Yes. Another question, though: Can they co-exist in a mutually agreeable code of ethics and practices? Here again the answer is in the affirmative—but admittedly it's a weak aye—one probably more in hope than conviction.

The present rukus these two factions find themselves in today is one which could probably have been alleviated had the present programs of various states and the federal government been initiated a dozen years ago, and modified as the numbers of fishermen and boaters increased since then.

The Johnny-Come-Lately approach to what was a very evident potential problem as early as the late 1940's has allowed a serious outdoor controversy to fester.

No need crying over spilled milk though. The problem grows steadily worse and undoubtedly will continue to do so until some drastic changes are made—then strictly enforced!

If we had the time, and patience, there is the possibility the problem might eventually iron itself out as more boaters turn to part-time fishing and more fishermen try part-time pleasure boating. If we tried this approach, however, things would get much worse before both factions finally became cognizant of each others needs, rights and problems, then worked them out in a mutually agreeable program between themselves.

We don't have that time in most of our better combination fishing-boating waters.

Already far too many of them are ruined for both sports for the time being because the overpopulation of boaters and fishermen doesn't know how to utilize the insufficient water surface for their mutual needs.

The first thing both sides, in addition to governing and enforcement agencies, must realize is that each faction is entitled to use of the waters, neither more than the other.

I'd like to see boaters realize the fallacy of the recently expounded theory that motors don't bother fish. They do bother fish—and furthermore they do more than that to anglers. They usually infuriate them!

Maybe when trolling deeper waters a motor is of little concern to some fish. But take a man who is casting a surface bait on still waters. He's an artist. He likes to watch the artful water rips of his plug. It's only natural he doesn't appreciate his efforts wasted as the lure bobs in a rolling wake. Underwater plug casters likewise don't like to dunk their baits in waters muddied by the crashing of a wake against a muddy bank, either.

In some instances, like rockfishing in shallow waters, just the noise and turbulence of a boat will spook fish for a half hour or so. I've had this happen to me many a time.

On the other hand the fisherman must realize he can expect frequent interruptions when he anchors to fish in a channel, or blocks that channel trolling a long line or two. Probably that fisherman would be much better off to leave the channel exclusively to boaters, and furthermore he probably would catch more fish along the shoreline or in a sheltered nook.

Let's face it. Boaters should have a place like a channel where they can get out and give their sleek cruisers and runabouts a speed run occasionally, and they're also entitled to areas where they can cruise at speeds faster than a fisherman is accustomed to.

In some instances it seems plausible to segregate sections of lakes and in other instances to segregate times.

There are places now where boating is allowed on an almost unrestricted yet safe and courteous basis from the relatively poor fishing hours of 10 A.M. to 4 P.M. The remainder of the day is set aside primarily for anglers. There are some instances, too, where certain days are set aside, primarily for the benefit of either sport, although the other is allowed on a somewhat curtailed basis on its off day.

Water skiing is a particularly sore point, especially because four water skiers need about 200 acres in which to play. That same water acreage could accommodate 100 or more fishing boats.

Another point which must be cleared up, particularly in view of the speed and horsepower race in the boating industry, is the age and other qualifications required of boatmen.

One can't truly expect a pre- or early teen-ager to fully appreciate the potential destruction he has at the wheel of a power packed boat. Nor can that same youngster be expected to appreciate the problems of a good fisherman.

Licensing of those who operate boats of over a certain horsepower rating could do much towards eliminating some of the problems. Probably detailed tests similar to those required of those applying for motor vehicle licenses would be in line. What good is a licensing program unless some definite specifications are set to weed out the too young and the undesirables?

After all if we can set up some definite rules, enforce them, and then remove those incapable or unwilling to abide by them, we may not have resolved this little war, but at least we've claimed a major battle.

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By **JOHN BOHANNAN**

Boating Editor, Lancaster Sunday News

Yes, I think boaters and fishermen can co-exist, but it will take more than conversation to bring it about. To my way of thinking the operation of motor boats at high speed in the vicinity of fishermen is completely incompatible, and something should be done to prevent this situation.

Let's take a look at the problem and see why folks want to go fast in a motor boat. Some do it because they must, others merely because they enjoy it.

In the first category are those operating tow boats for water skiers. They have to go fast to keep the water skiers planing on the surface of the water. If they throttle down enough to keep from annoying fishermen, the skiers will find their skis sinking under them for a dunking.

The answer is obvious. Water skiing should be restricted to a definite area on any small body of water, and this skiing region should be plainly marked by buoys.

Then the skiers can go as fast as they wish, cutting fancy capers without disturbing others.

What about the man who just enjoys planing along in a fast boat at top speed?

As a matter of courtesy he should swing wide to avoid fishermen, or else throttle down to trolling speed until he is far enough past them to eliminate any discomfort his wake might cause.

This is just plain horse sense and decency. It has been practiced for many years by thoughtful skippers who know how a heavy wake can shake up a man who is trying to fish.

Already I can hear one of you fishermen saying:

"Yeah, but they don't slow down. Just last week end a fellow went past me wide open and I'll bet he didn't miss me by 10 feet!"

We must remember that the waterways these days are crowded with thousands of persons who are venturing forth in their first boats. Unfortunately some of them know nothing about the rules of the road. Some think "you can drive a boat anywhere, just like a car." Others believe water is "soft stuff—it won't hurt anybody or anything."

These are the newcomers who are involved in collisions, who run aground, who go tearing through fleets of anchored fishermen, who pass too close to fishermen along the shore.

A vast educational program is under way to acquaint these folks with the fundamentals of safe, trouble-free boating. This program is being conducted coast-to-coast separately by local units of the United States Power Squadrons and local flotillas of the United States Coast Guard Auxiliary.

Already the effects are being noticed, and as the program keeps on expanding, combined with safety efforts of the Outboard Boating Club of America, the National Association of Engine and Boat Manufacturers and other organizations, more of the new skippers will get the message that it's just as dangerous and stupid to show lack of courtesy on the waterways as it is on the highways.

Now that we are assured that something is being done to prevent motor boat fans from scaring fishermen, what about the fish?

The Champion Spark Plug Co. sponsored a series of scientific tests indicating that rapidly-turning propellers and underwater exhausts have no effect on fish.

In my own experience I have noticed that some of the days when fishermen have been enjoying record catches have been when the water has been covered with power boats scurrying here and there.

Let's take a look at the other side of the ledger. Are fishermen always considerate of boat owners? No, they are not!

They stay up all night with bright lights shining through the windows of nearby cabin craft. They anchor in the middle of narrow channels. They fish from private docks and even from the decks of private craft, leaving a mess of discarded bait. They leave scraps of food around docks and cribs to attract rats.

Plenty of education is needed on both sides, but I am sure conditions will improve every year. We Americans have a way of getting along together, and the more we understand the other fellow's problem the more we will try to see that he is free to enjoy his sport as much as we enjoy ours.

Creating Color

BY DON S



FLY TYING KITS of commercial sale contain most of the minimum equipment necessary to tie Cahills and other flies. Inexpensive, they often contain fair material for the beginner learning to tie his own. Expensive gamecock necks are hardly economical for a new tyer.



INSERT a size 12 hook in jaws of vise, tie short piece of waxed thread to the shank. If you have a booklet on tying knots or refer to your back issues of the Angler, better learn to tie hitches.



TAIL is formed by tying a piece of waxed thread to the shank of hook.

■ For a number of years I had tied flies commercially, both by "prescription" of individual troutmen and stock orders from retail sport stores. During the course of the winter evenings, several hundred dozen dry flies, wet, nymphs and streamers were tied. At one time or another I was asked to tie practically every pattern listed in the "Whose Who in Trout Flies," from the Adams to Zulu. However, there were always some of the old standard and reliable patterns, such as the Coachmans, Gray Hackle, Quill Gordon, Black Gnats and Cahills on every order. These were in strong demand.

Whenever I was caught up on back orders, I invariably attempted to keep ahead of the demand by turning out a few extra dozen flies for stock. The Cahills were patterns I kept tying regularly, but try as I would, I never stayed far ahead of the demand, particularly in the dark model. Orders came so constantly, that every time I bent over my vise, the first fly recipe that flashed to mind read something like this: hook size 12; tail—brown hackle fibers; body—gray muskrat, under hair or gray wool yarn; wings—barred mandarin or wood duck flank feathers tied upright; hackle—brown.

MORE



WIND BODY material up to wings, knot tying thread around material. Cut off remaining portion.



NEXT TIE in a hackle feather, knot tying thread around material. Cut off remaining portion. hook in the direction of the hackle.



TIE IN BODY material, spun fur, wool yarn is OK for Cahills.



TIE IN portion of speckled wood duck feather near eye hook. Few turns of thread in front and in rear of feather will cause it to stand erect on hook.



BUTT END of wing feather is cut off, then wind the body material in place.



HACKLE PLIERS are necessary for good job of winding hackles in place.



FINISHED CAHILL, ready to fool trout and panfish.



WINGS on dry flies can be of other materials; plastic, hackle tips or hair.

It is doubtful if there is a more popular fly among trout fishermen or for that matter among those who enjoy fly rod work for plate size bluegills, than the Cahills, both light and dark patterns, unless it would be the famed Royal Coachman. But the Cahills' popularity stems from the fact that there is not a single trout stream in Pennsylvania that won't produce trout with these flies. And I frankly admit, after several decades of following the rod and reel trail, both the light and dark Cahills are among my favorite flies.

The reason is quite simple. Along about June when fly fishing reaches its peak, a number of winged insects in the May Fly family appear on Keystone trout streams that have a strong resemblance to the Cahills. Trout gorge themselves on these tidbits. Cahills tied on hooks ranging in size 10 to 16 are readily taken by big trout, especially toward evening when hatches normally reach their peak of activity.

The Cahill flies are also good carry-overs into fly fishing for panfish. Cream and brown are two colors of which freckled faced bluegills are particularly fond. The angler simply needs to cast one of these dry flies near an old submerged stump, bed of lilies or sunken tree limb, twitch it across the surface and he is absolutely guaranteed action! And these gamey fish are not fussy when it comes to the appearance of the Cahills. The body can be fat, pudgy as an inflated balloon, or lean as a bare hook. Wings can stand upright or appear as matted as a hay field after a hail storm; hackles can be long, short, too few or too many. The cream or toasted color Cahills are irresistible to this panster tribe.

In fact, it is from this stand point I consider the Cahills excellent patterns for the novice to learn the fundamentals of fly tying. The first dozen or so models will certainly not have the appearance of those tied later after several weeks of practice. But these foremost attempts at fly construction provide good lures for the bluegills. Later, as the flies become more slim and trim, they can begin flying over the trout stream.

All of this brings us to the point of how a Cahill dry fly is tied. Before reading on, take several moments to glance over the series of illustrations. These show step by step procedure for tying the Cahill. In all cases, the amount of materials (number of fibers used in the tail, size of body, and length of hackles) have been somewhat exaggerated, simply for clarity in the photographs. The procedure here is important.

A size 12, turned down, tapered eye hook is good to begin work. This might be termed an all around size because it is commonly used for trout and not too large for panfish. Fasten this size hook in the jaws of the vise. Tie a piece of waxed thread to the shank and wind it toward the bend. First step involves tying the tail.

TAIL: Pull four or five fibers from a stiff rooster neck feather (hackle feather). Hold this material against the hook and wind the tying thread around both the material and the shank until the fibers are held firmly in place.

WINGS: Many tiers prefer to tie the body material in place on a dry fly (in this case, it is spun muskrat fur, or cream or gray wool yarn) immediately after the tail assembly, but then position the wings before the body material is wound into place. Cahill wings are made with sections of speckled feathers found on the flanks of wood

ducks. The tying thread is wound around the butt end of the feather. Then the wing material is pulled upright and divided while several thread wrappings are placed in front and criss-crossed between the sections so that the wings stand erect.

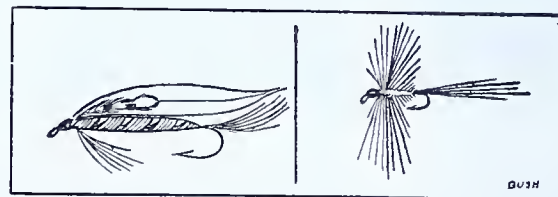
BODY: Now the body material is wrapped around the hook until the shank is completely filled. This material is also wound up to and over the butt ends of the wings to thus form a smooth, well shaped body. A variety of materials are used for fly bodies, depending, of course, on the particular pattern being tied. Fibers from a peacock tail feather are used to form the bronze-colored body on Coachmans; silver tinsel is frequently used along on such flies as Sliver Doctor, and the Mickey Finn streamer. Chenille or silk floss is popular for the body of the Black Gnat, Queen-of-the-Waters and Orange Fish Hawk patterns.

HACKLE: Now comes the addition of hackle or the fibers which support the fly on the water. This is simply a feather found on the neck of game cocks (good necks are expensive). Normally, a cream-colored feather is used on the Light Cahill; a dark brown hackle feather used on the dark Cahill. The prime requisite is a feather which has stiff, glossy fibers so that they do not bend under the weight of the small fly.

One or two of these long feathers are tied in place just in front of the wings. Then, grasping the tip of the feather with the hackle pliers, the hackles are wound five or six turns around the hook. The tying thread is then finally wound over the free end of these feathers, and knotted securely. A touch of varnish or glue over the knot completes the Cahill dry fly.

Actually it takes far longer to describe the procedure than to administer the operations. I could have tied two possibly three Cahills in the time it has taken to write the preceeding paragraphs. Naturally, the first few Cahills tied will have a somewhat ragged appearance. The first half dozen may even unravel soon after they are removed from the vise. But after the first few trial runs, the flies become more presentable, perfectly suitable for luring big bluegills into the creel. And after the first few dozen or so are tied, they become reasonably suited for flying over trout streams.

Of course, fly tying and tying the Cahill could be described in far greater detail. And chances are I would have gone into more descriptive words were it not for the illustrations accompanying this article. I would have gone into far more detail concerning the merits of the Cahill flies on the streams and ponds of Pennsylvania, but this too, is pointless. These patterns are so well established in the ranks of many Pennsylvania anglers nothing I would say would add to the prestige of the Cahills.





LOSING BATTLE or rear-guard action, the fight against pollution and all its evils will still go on so long as there's **ONE** fisherman left in America.



Fish, Wildlife, and Clean Water

Pollution is an inflammatory word to 25 million American sports fishermen and hunters. They understand better than most other people that the disposal of more and more wastes in the country's lakes and streams is destroying the environment in which fish and wildlife can live and multiply.

Fishermen, hunters, and other conservationists have been in the vanguard of the fight against water pollution. But they realize that up to now they have not been winning this battle.

Public agencies have been carrying out programs of fish and wildlife restoration for many years. Yet, according to the U. S. Fish and Wildlife Service, the total area of fish and wildlife habitat rendered unproductive by water pollution and other causes each year is greater than that created by restocking streams and other restoration measures.

No one knows, of course, exactly how fast the deterioration of the fish and wildlife environment is taking place. There is no precise measurement. A census of ducks is conducted annually, but there is no way of counting all the fish in the nation's streams, much less the smaller forms of aquatic life upon which they feed.

In mid-1960 the Public Health Service, aided by the Fish and Wildlife Service and State fish and game agencies, began counting fish killed by water pollution. Within three months, before the reporting system was in complete operation, more than 100 pollution-caused fish kills had been reported from around the country.

Fish Kills Are Yardsticks

Fish kills provide a yardstick for measuring the biological safety of our streams, lakes, and coastal waters. In many cases, such kills are the result of carelessness or ignorance. For example, a slug of cyanide, acid, or other harmful chemicals are discharged into a river and flows

along for many miles before dissipating, killing thousands of fish as it flows downstream.

The pollutant passes a given point in the river in a few minutes, but its effects may be felt for years. When the scourge has passed, the stream must be repopulated not only with fish but with the aquatic food they eat. When conditions are right, the stream can be restocked in a single season, but it takes several years for the progeny to grow up and for the water to regain its natural balance.

Big fish kills usually are spectacular. Yet it is the slow, unspectacular erosion of the environment of fish and wildlife by pollution that causes the greatest losses and is the source of the greatest concern to conservationists. Fish kills cannot take place unless fish are there to be killed.

A gradual increase in pollution may slowly kill off the fish population in such a way that the dead fish or the decline in numbers is not noted. The fishery is destroyed without exciting public protest because few people realize what is happening. In some streams—in the East particularly—the destruction of fishing grounds has proceeded at such a slow pace over such a long period that people have long since forgotten that fish were once abundant. The lesson for the future is clear.

If the fish habitat is good, the population remains stable, and the annual increase can be taken by sportsmen or commercial fishermen without damaging the breeding stocks. If the environment is improved, the fish multiply more rapidly. If the environment is allowed to deteriorate, they die off.

It is the same with wildlife generally. The food chain is a basic element of the environment. Chemicals and organic material found in nature provide food for microscopic plants, insects, and animals. These, in turn, are food for larger forms of life. These larger organisms supply food for bass, trout, catfish, and pike. When these fishes die, they also provide food for the microscopic organisms and the cycle is completed.

Fish, like all forms of life, must have oxygen to live. They use the oxygen dissolved in the water by breathing through their gills. Water containing as little as three to five parts per million of oxygen is enough for some kinds of fishes. Others would suffocate unless they could get more.

When organic waste like raw sewage reaches the water it begins to break down, using up the oxygen dissolved in the water as it does so. Fish and other water animals suffocate if the process of decomposition requires so much oxygen that the amount left in the water falls below the critical level.

Just as too much fertilizer or too much water may destroy an agricultural crop, too much sewage or other waste sloughed into a stream can destroy fish and wildlife. If the stream is overloaded, natural purification processes cannot keep ahead of the load.

If the overload is relieved, the stream in time can recover, permitting fish to return. This has happened in many places after sewage treatment facilities have been built. In many other places organic wastes discharged into watercourses are increasing rapidly, killing fish and other aquatic life or forcing them to migrate.

Death or migration, however, is not the only result of polluted waters. In a number of instances, investigators have found that fish collected downstream from sewer outfalls were sickly, abnormal, parasitized, or dwarfed.

Domestic wastes in small enough quantities are not necessarily harmful to fish. Properly treated sewage containing nitrogen and phosphorus, for instance, may stimulate aquatic growth in a stream and thus improve food supply for the fish.

Wastes In Streams Increasing

Since the turn of the century, however, the volume of municipal wastes discharged into watercourses has increased more than 200 percent while industrial pollution has risen 2900 percent.

Organic wastes used to be by far the principal cause of the pollution that destroyed fish and wildlife habitats. Today, with the enormous use of new chemicals and synthetics, the character of the country's wastes is changing. Insecticides, pesticides, herbicides, and many other synthetic organics are now increasingly important causes of pollution.

In 1943 there was only one synthetic insecticide on the market. In 1955 there were over a hundred different materials being used commercially. From 1940 to 1950 there was a threefold increase in the use of insecticides; from 1950 to 1955 the amount used doubled again; and since that time it has almost doubled once more.

Many of the new synthetic insecticides and other chemicals are extremely toxic to fish even in very low concentrations. One compound tested by the Public Health Service is toxic to bluegills at a fraction of a part per billion. Studies show also that as the period of exposure is increased, concentrations which are toxic become smaller.

Widespread use of the various new chemical compounds in industrial processes, in agriculture, and in the home, is creating new and complex pollution problems of great concern to conservationists. Although insecticides and similar materials are more often applied to land for the control of forest and farm pests than directly to water

surfaces, they appear as run-off from treated land areas. Extensive fish kills have already resulted in several localities.

The new pollutants, moreover, resemble soil materials in that their source may not be a single point along a stream but an entire watershed. (Fish kills occurred in at least 15 streams in the Tennessee River Valley following the application of a synthetic insecticide over 400,000 acres of cotton in eight Alabama counties.) In addition, the effects of some of the new pollutants may be felt downstream for distances as great as 1,000 miles.

Toxicity of the new pollutants to fishes is not the only danger. The introduction of any pollutant, whether organic or inorganic, may upset the balance of the aquatic environment if it is lethal to a particular link in the food chain. If the food the crawfish eat is killed, the crawfish disappear. Then the mink, raccoon, the bass, and the egret, losing an important food source, migrate or die.

Studying a small Ohio stream polluted with domestic sewage, Public Health Service investigators found that the further they moved downstream from the point where partially treated wastes were discharged the more fish and the more species they could take. They could find no fish at all in the immediate area of the municipal treatment plant. Two miles downstream they took eight species in a series of collections. A mile further down they took 12 species. Thirty-two species were found 4.4 miles downstream. Still further down, where the water had become clean, they took 36 species. In addition, fish become more abundant at each collection point.

The temperatures of the country's lakes and streams are rising. The most important reason for this is that a growing and expanding industry is using more and more water for cooling purposes in its manufacturing processes and then returning the water to its source at higher temperatures. Another reason is that cultivated fields have been replacing forests, reducing shade, and inducing more rapid run-off and greater siltation. These phenomena are called thermal pollution. It reduces the oxygen content of the water, and is changing the character of the Nation's fish population.

As fishermen know, the most desirable species of fish, in general, are found in clear cold streams and lakes. Trout, salmon, whitefish, and fresh water herring are among those in this category. Increasing temperatures and decreasing oxygen content are shrinking the fishing grounds—particularly in the headwaters of streams where these species thrive.

Many of the country's trout streams are approaching borderline temperatures. A rise of only two or three degrees is sometimes sufficient to eliminate trout altogether. A stream ceases to be a trout stream if temperatures become too warm for trout on only one day of the year.

Water temperatures may become so high that even some of the more desirable warm water species—sunfishes, white bass, black bass, and crappies, for example—may be affected. If water becomes warm enough, undesirable species such as carp, dogfish, and suckers, crowd out the gamefishes because the former are more tolerant of heat and low oxygen concentrations.

The danger to the fish and wildlife resources of the Nation because of increasing pollution of watercourses is a serious matter to fishermen, hunters, and conservation-



ts generally. But all Americans have a stake in the preservation of a country in which fish and wildlife can live. For forests, fresh air, and clean waters are the heritage of all citizens.

Even beyond this, fish and wildlife play the role of the miner's canary. If the waters of the United States become so polluted that these animals cannot survive, it is a warning to man himself.—U.S. Public Health Service

*

Sketch . . .

Everybody knows Izaak Walton wrote *The Compleat Angler, or the Contemplative Man's Recreation*, in 1653, to tell people *how* to fish. But not everybody knows *why* Izaak Walton and his little books were such an astounding success in seventeenth century England.

It all grew out of the fact that fishing was a vocation, not an avocation, and therefore—*gentlemen did not know how to fish!*

That is right. Gentlemen did not know *how* to fish.

Take, for instance, the Cabots. King Henry VII issued *Letters Patent* to John Cabot and his three sons in 1496. The *Letters Patent* authorized the Cabots "to saile to all parts, countreys, and seas of the East, of the West, and of the North, vnder our banners and ensignes, with fve ships of what burthen or quantity soeuer they be, and as many mariners or men as they will haue with them in the sayd ships, upon their owne proper costs and charges, to seeke out, discover, and finde whatsoever isles, countreys, regions or prouinces of the heathen and infidels whatsoever they be, and in what of the world soeuer they be, which before this time haue bene vnknown to all Christians. . . ."¹

That is how Sebastian, son of John, is credited with

being the first to tell an American fishing story; and, like most fishing stories, it is supposed to be absolutely and elastically true.

Duly authorized by the *Letters Patent*, it seems that the Cabots found their way to Newfoundland. Not being endowed with ready-made maps, the Cabots were unaware of the fact that this particular island lies at the mouth of the Gulf of St. Lawrence, but they were aware of the fact that they were in the midst of waters teeming with fish. In fact, there were so many fish that Sebastian left some of his three hundred men to explore Newfoundland. He was not afraid of them starving, for, he said, the waters thereabouts were so thick with codfish that he had hard work forcing his vessels through the waters in that vicinity.

Some years later, the two Richard Hakluyts unwittingly set the stage for the next of the American fish story episodes. One of the Richard Hakluyts published, in 1582, *Divers Voyages Touching the Discovery of America* and in 1584, *A Particular Discourse Concerning Western Discoveries*. By 1589, a third volume was entitled *Principall Navigations, Voiages, and Discoveries of the English Nation*. A better press agent than a book that fires the imagination with adventurous zeal and manly challenge is rare and the cousin of this English writer—the other Richard Hakluyt—sent Sir Martin Frobisher to seek a Northwest Passage.

What a wonderful world was the New World! John Hawkins' tales of flying fish and flamingoes and the art of smoking! And then there was the tale of Master Hore.

Master Hore, the story goes, persuaded a number of young lawyers of the Innes of Court and Chancery to go to Newfoundland and there their ship was wrecked. Without provisions, they lived on wild fruit and then on each other, for none of them knew how to catch a fish!² Alas and alack, they were gentlemen.

By the time that Sir Humphrey Gilbert secured a patent from Queen Elizabeth on November 6, 1577, several countries had learned that fish were vendible merchandise and the Great Bank spilled its fish-laden waters from Newfoundland to the Gulf of Mexico, a distance well over a thousand miles. Gilbert's ventures were less than happy and far from profitable, but that did not discourage his half-brother, Sir Walter Raleigh from pipe-dreaming about fortunes to be made from tobacco. To finance the venture, Raleigh obtained a monopoly of the wine industry.

Among the names of those listed as one of those entitled to proprietary rights in Virginia was that of one Richard Hakluyt. The ill-fated *Lost Colony* left behind a tradition that the Indians in the area of the *Lost Colony* were Lenni Lenape who moved northwards to Pennsylvania where they bargained with William Penn and other early Pennsylvanians. One after another of the Raleigh expeditions poured forth out of the Atlantic whilst Raleigh himself pined away in prison.

Under sentence of death, Raleigh somehow persuaded King James I that there was a gold mine in the Orinoco region. For 1500 miles, this long and winding river drains the llanos of Venezuela and eastern Colombia, far from the "Carolina" coastal strip of the *Lost Colony*. Fate and fortune frowned with a fury and poor Raleigh found—more fish than gold, and Raleigh's execution followed one sad day in 1618.³

Walton's seventeenth century opened with half of the present boundaries of Pennsylvania being parcelled out by King James I to the Virginia Company. The year was memorable for the First Charter of Virginia and not long thereafter 120 colonists planned to land near where Raleigh established his colony at Roanoke Island. There were three small ships, the *Sarah Constant*, the *Discovery*, and the *Goodspeed*. Captain Christophere Newport directed the three ships by way of the Azores and the Canary Islands toward the West Indies and then northward. A storm blew up and the route was lost. The ships entered Chesapeake Bay and the two headlands were named for the two sons of King James I. To this day they are Cape Charles and Cape Henry. Further inland, the waters were good and deep for anchorage. This was named Point Comfort. There they found a river and this they named King James.

The site was low and swampy, not at all suitable for a colony. But with Indians more than ready and willing to shoot a few arrows, if the colonists moved elsewhere, the low and swampy site had to suffice for the time being. Following a custom established by the East India Company, a box of instructions was opened on landing and therein it said that the King's Council for Jamestown included Captain Newport, Captain Gosnold, Edward Maria Wingfield, John Smith, John Ratcliffe, John Martin, and George Kendall.

By majority vote, the Council could expel a member of the Council. John Smith, who had been in irons on the ship on the way over, was the first member expelled from the Council.

There were twelve laborers and a few mechanics and the rest were—*gentlemen*. As with Master Hore's lawyers of Innes of Court and Chancery, so with the English in Jamestown. There were fish in the rivers. There were oysters in the bay. The question was, *how* do you get the fish? *How* do you get the oysters?

Yes, as I was saying, that is why Izaak Walton wrote *The Compleat Angler, or the Contemplative Man's Recreation*. Capitalizing on the romanticism of the day, Walton spirited the venturesome to yet another world, a world that is picturesque, surprising, strange, and altogether alluring. Who knows what finny vertebrate lurks there in yonder pool just anticipating the wily lure of a bait-hidden hook?

—B. J. L. Shockley

¹ LETTERS PATENT TO JOHN CABOT, March 5, 1496. F. N. Thorpe, *Federal And State Constitutions*, Vol. I, p. 46-7.
² William Wood, *Elizabethan Sea-Dogs*, A Chronicle of Drake and His Companions, (New Haven: Yale University Press, 1921), p. 8.
³ *Ibid.*, pp. 35-36.

A Secret Place To Fish

A handful of freckles on a turned-up nose
 Patched-up jeans and muddy toes,
 An old cane pole and battered-up can
 Dad's old straw hat and a baked-on tan,
 A faithful pup with no pedigree
 A vacant space where a tooth should be,
 A secret place to lie and dream
 A fishing hole on a lazy stream,
 The birds, the frogs, the bugs and snakes,
 And grub like only Mother makes,
 A special time when Dad can come
 To talk and fish till day is done,
 It's such as these that leap the span
 From a freckle-nose kid to a worthwhile man.
 —Paul T. Gilbert



GRIN OF THE YEAR award goes to Warden Ray Hoover who clobbered this 34½-inch, 9-lb., musky at Carmen's Eddy, Conneaut Creek.

❖

What Does a Fish Warden Do On His Day Off?

Warden Ray Hoover who has charge of Crawford County Waters, "where the musky is king" could start the pressure no longer. After two years of listening to the stories from the musky fishermen in the area he decided to find out for himself just what the "disease" was all about.

On Friday the fourteenth of October, Mr. Hoover entered the Northwest Regional Field Office and emphatically announced that he was going musky fishing and asked Supervisor Sheldon to borrow a musky plug. Sheldon brought out a well worn Heddon Vamp Spook in the perch finish and informed Hoover that in the dim daylight, he had taken a few muskies on said bait. Hoover looked at the bait with some surprise and remarked that it was large enough to catch a horse. Proceeding down Conneaut Creek to the vicinity of Albion, he selected a long eddy, which is known locally as Carmen's Eddy, and began easting in earnest.

Time went by and the easting continued with less vigor as his attention was turned to six wood ducks which whistled by and a fat fox squirrel that came down to the water for a drink. Moving down the stream a few feet he carelessly east the spook across the stream beside a submerged log and then it happened: SWOOSH!, a three foot jump out of the water, two more jumps and then the fast rush upstream. Right then and there another MUSKY FISHERMAN was born.

Fifteen minutes later a 34½-inch, 9 pound musky was securely fastened to the side of the boat and it was most interesting to see the grin on Hoover's face and the very dejected look on the face of the musky.

Hospitalized Vets Enjoy Angling Day At Lake Wilderness

Twenty-five hospitalized veterans from Veterans Administration Hospital, Wilkes-Barre, Pa., were introduced to the fine art of angling recently at the end of a 7-week training program sponsored by the local Amvet Chapter. National Service Officer, Earl F. Detweiler, Jr., Wilkes-Barre, Amvets Commander, Dave Kasper and Eugene Boylan, Chief Recreation Officer of the VA Hospital arranged the program with instruction by John Perbach and Frank Mackiewicz, VA employees.

Pennsylvania Fish Commission personnel escorted the entourage from the VA Hospital in Wilkes-Barre, to Lake Wilderness, near Tunkhannock, Wyoming County, a regulated fishing lake, generously opened by the owner C. R. Brown, Wyoming County Commissioner. The lake yielded bass, bluegills and catfish, to the participants. Prizes, consisting of fishing tackle, were donated by local sporting goods dealers as awards to winners. South Bend Tackle Co. supplied the practice casting outfits and fully cooperated in the affair.

Fish Commission personnel assisting were: Warden Supervisor, Clair Fleeger, Wyoming County District Warden Steve Shabbick, and Luzerne County District Warden Jim Yoder. Others present: Myron Shoemaker, Laceyville outdoor writer, Representative James Jump, Wilkes-Barre, Representative James Wynd, Wyoming County, Wyoming County Commissioners J. Montross, Dr. Bryan Lee and C. R. Brown, the host.

The veterans, who enjoyed the fishing immensely, were treated to refreshments following the fishing fun. Officials hoped this would be the forerunner of more to come.

LAKE WILDERNESS, Wyoming County, scene of recent Veterans Fishing Day. Officials and personnel attending: First row, l-r, James Yoder, District Fish Warden, State Rep. James Wynd, Eugene Boylan, Chief of Recreation, VA Hospital, Wilkes-Barre, State Rep. James Jump, David Kasper, Amvets Post #190 Commander and Assistant Chairman of Program. Second Row, l-r, Steve Shabbick, District Warden Pa. Fish Commission, Clair Fleeger, Warden Supervisor, Northeastern Division, Pa. Fish Commission, John Pehach, VA Hospital employee and instructor, Frank Mackiewicz, VA Hospital employee, also an instructor, Myron Shoemaker, Exec. Director, National Council of Junior Outdoorsmen, Laceyville, Earl Detweiler, Jr., National Service Officer of Amvets and Chairman of the program and C. R. Brown, Wyoming County Commissioner and host at Lake Wilderness, Tunkhannock, Pa.



ACTION ARENA for the angling day for Wilkes-Barre VA Hospital vets is beautiful Lake Wilderness, Wyoming county. Here they are waitin' for a bite!



PARTICIPANT gets aid from Fish Commission personnel in untangling a backlash.

INJURY cannot dampen angling enthusiasm of Louis Novelli in wheelchair. Warden Supervisor Clair Fleeger, Fish Commission and Eugene Boylan, Chief of Recreation, VA Hospital.





—Presque Isle Light

Landlubber's Lighthouse

The electric lamp was still a dream in Thomas A. Edison's inventive mind when the Presque Isle lighthouse, guardian of shipping lanes on Lake Erie, was constructed in 1872-73. Edison put his first effective lamp together in 1879.

Despite its advanced age, the Presque Isle lighthouse stands firm and solid today—a picturesque part of Presque Isle State Park, the more formal name for the “Peninsula” which forms the snug harbor of Presque Isle Bay at Erie. Now that ocean ships traverse the Great Lakes as a result of the opening of the St. Lawrence Seaway, the light is more important than before.

We climbed the ancient and circuitous stairway to the “light” itself after *ANGLER's* editor asked us to write about it. There at the top of the stairs we discovered the most interesting aspect of the entire story. The source of the light which flashes many miles across the often-stormy waters of Lake Erie is a comparatively tiny, unfrosted 150-watt bulb. It is the highly polished and complex system of prisms and lenses which nurtures the glow and sends its reassuring signal to the inland mariners.

Electrical controls now operate the apparatus but for many years it was the task of a lighthouse keeper to keep it in operation—before and after electricity. Records state that the lonely vigil of the keeper was broken only twice yearly by the visit of a tender which delivered supplies. Occasionally, he walked to the bay side of the peninsula where he kept a boat and rowed over to Erie for a shopping trip.

Presque Isle was true wilderness in those early times—a far cry from the well-manicured appearance it presents today with seven miles of white sand beach, low-profiled beach houses in modern, pastel colors, and four-lane entrance and exit roadways. But its modern improvements

make it possible for more persons to enjoy it. Its off-shore fishing is always good and sometimes fabulous.

Apparently the Presque Isle lighthouse has never failed to send its signal—except that it does not operate during the winter when the shipping season comes to an end—since it was first lighted on July 12, 1873. It is operated by the U.S. Coast Guard.

The daily log of the lighthouse keepers over the years reveals some interesting and dramatic episodes. For example:

“June 17, 1874—The tug *Hercules*, Capt. Thos. Dunlap with 4 men & scow with 5 men was caught in a gale from the NE two miles east of this station to day at about one O'clock P.M. She broke lose & drifted ashore ½ mile from Station & tug was beached. The men got off all right with a good wetting. Old Mr. Dunlap 86 years old was on the tug and was helped ashore by the others and whole party came here for assistance.”

“Nov. 1, 1883—A sailboat was found in the bay today sunk and the men that was last seen in it are supposed to be lost. . . . They was over to the peninsula a duck hunting.”

People still go over to the “peninsula a duck hunting.” In fact, the demand for duck hunting blinds today is so great that a system of registering and drawing (lottery style) is used in order to eliminate the showing of partiality and satisfy sportsmen's interests in the matter. About 100 blinds are allotted each year.

We have seen a photograph of the lighthouse which was taken in 1885. Compared with a photograph taken only yesterday there is little change. It is painted differently. The fence around it is of different construction. Some of the old trees are gone and new ones have grown up.

But the purpose and function of a lighthouse is such that little change is required over the years to fulfill the fundamental mission. The Presque Isle lighthouse is, apparently, destined to remain a charming and necessary part of the scene on Presque Isle State Park for many more years to come.—*Bill Walsh*

*

Hackles Up!

Good quality Game Cock hackle is a very important part of trout lures. Undoubtedly stiff hackle on spiders as well as on the more conventional floaters accounts for their life-like appearance to trout.

But how about hackle on the underwater lures? Here also our lures must have good quality hackle when fishing fast streams. Even in what might be called slow-water pools there are heavy invisible currents. It is impossible to entirely eliminate drag, even with casts directly upstream. If a lure is attached to a leader there is drag or water pressure on the hackle and body dressing. With only slight water pressure soft hackle hugs body of lure and mats down with the usual body dressing so a lure looks about as alive as an old mop.

For example; tie a Brown Hackle with soft hackle wrapped in usual way with outside of hackle toward eye of hook. Place the Brown Hackle in water a few minutes, take it out of the water and see how easily hackle hugs the body. Now tie another Brown Hackle with good quality

Game Cock hackle by wrapping hackle with inside of hackle toward eye of hook. Place lure in water a few minutes, remove it and try to press hackle against body of lure! Our most valued souvenirs are nymphs with hackle as stiff as a second-day beard.

The coarse stiff part of rabbit fur is worked into dubbing for the body of March Brown Nymph for the very purpose of retaining life-like appearance of the Nymph under pressure of water.

One of the best ways to eliminate the flat mop-like appearance of a lure is to tie stiff caribou or deer hair on the hook bass-bug style. We did this on the Surface Nymph.

Surface Nymph is a body lure without hackle, wings or tail. As name indicates we started fishing Surface Nymph on the surface. Caribou hair on 3X fine hook gave the lure excellent floatability that is so attractive to trout. Light also passes through the stiff caribou hair and further increases fish-appeal. Our harvest really came when we added lead to leader and fished the Surface Nymph underwater, especially near bottom of the stream. Bouyancy of the lure practically eliminated possibility it would snag bottom.

Surface Nymph would not look bedraggled after fishing it for a long time, even though we did not frequently change lures, often using a dozen in a few hours. Knights of old threw away lure after hooking a trout. Of course this would be a shocking waste of good hooks; but we do compromise by tying on a fresh lure.

Pursuit of quality Game Cock necks will continue; but with less vigor, in a carefree way. After all we can do a lot of fishing with the hair lures.—Art Clark

✱

Some folks who talk about conservation are like blisters . . . they don't show up until the work's done!

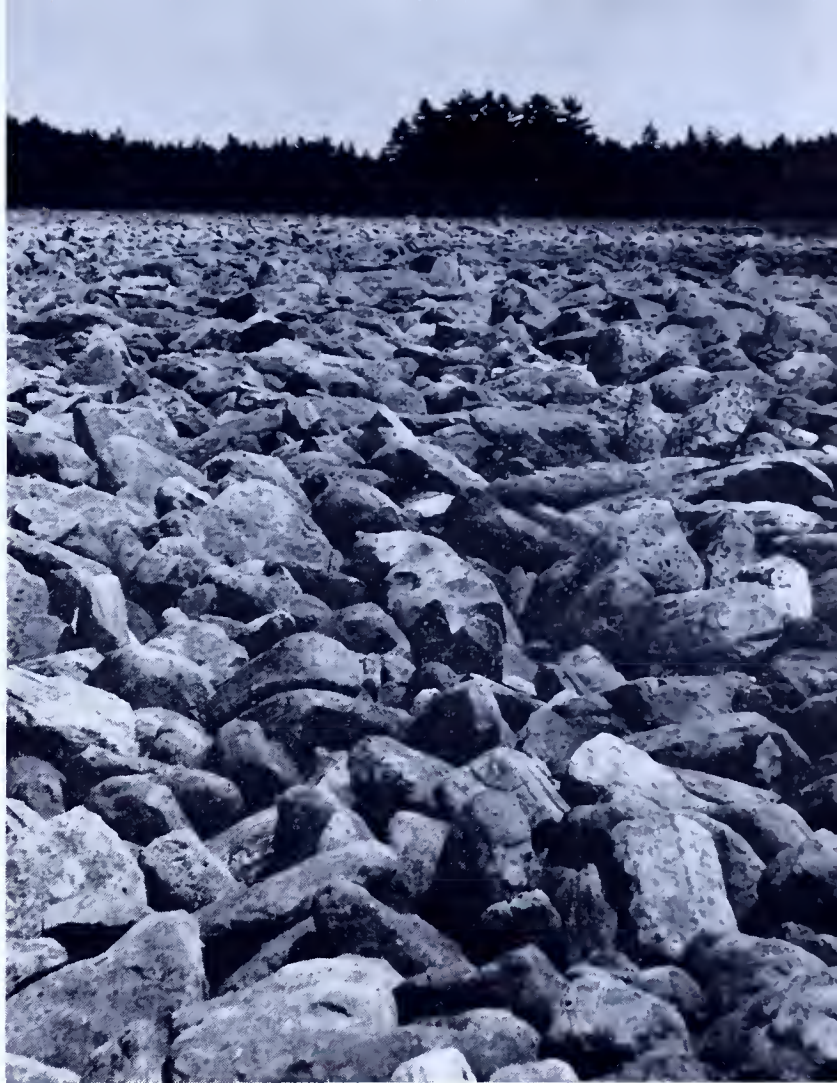
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An old Indian stood on top of a hill with his son, looking over the beautiful valley below them. Said the old Indian, "Some day, my son, all this land will belong to the Indians again. Paleface all go to the moon."

✱

To Start a Boy Out Wrong . . .

I don't think there is a Fish Warden in Pennsylvania that doesn't like to see a family out fishing, enjoying themselves. We like to see a father teaching his children how to fish and we also like to see them teach children a respect for the Fish Laws. But . . . how can some of these people expect their children to live up to the laws when they, themselves do not set the example. Many times, older fishermen are apprehended and observed fishing without a license. When challenged they quickly hand the rod to the child declaring it's all in teaching angling to the boy. Often when the case is settled and closed, by field acknowledgement or via a hearing, the boy learns the truth, the violator turns on the warden with abuse and wrath that is undeserved. I read somewhere . . . "if a boy is brought up hunting or fishing, he will not end up in prison." I wonder if that includes boys started out all wrong by parents who should set an example of respect for the law.—Warden Joseph E. Bartley



Sea of Rocks

One of the strangest oddities in Pennsylvania is this field of rocks in Hickory Run State Park, near White Haven, Carbon County. Fishermen, visiting the park while trout fishing in Hickory Run, generally take a few moments to examine this strange field. Nearly a mile in circumference, the huge stone deposit was allegedly dumped there thousands of years ago by a glacier. The over-all appearance of the field is one of striking flatness, causing many viewers to refer to it as Pennsylvania's inland sea-of-rocks.—Don Shiner

✱

*The trouble with many people I know
Is they'll stick in their oars, but refuse to row!*

•

Swimming is America's most popular sport, numbering 33 million adult fans. Fishing and dancing come 2nd with 32 million, followed by bowling, hunting, baseball or softball, golf and badminton in that order.

✱

Dream Stream

On my very first foray on the Caldwell in Warren County I took seven nice brown trout from a pool without so much as moving from my tracks. Nevertheless, there was something amiss. Sure, I was delighted with the fish, but I had come by them too easily. A couple of days later I was back on the same spot where an hour's hard fishing failed to elicit a single strike. However, such inconsistencies make a stream interesting and the Caldwell was no exception.



—The Caldwell

*

The frequency of such experiences has about convinced me that a stream is largely responsible for the behavior of its fish. I'm confident that most anglers employ tactics suited to both the stream and their quarry. And a stream endowed with an abundance of physical features is one that is favored by both fish and fishermen.

The Caldwell is richly gifted. There are more features concentrated in its considerable length than in any stream I've ever seen. The big (6 pounder) brown trout which held forth for three successive years in its lair under a persistent pile of driftwood can attribute its longevity to the inaccessibility of its fortress as well as to its uncanny ability of making the most of its surroundings.

The pools in the most fishable length of the Caldwell are deep and clean and generously filled even during protracted dry spells. One in particular is a standout. It is located just a short distance below the Selkirk bridge and its beauty demands immediate attention. It is an unusually long pool with matching width, its pellucid water deep enough to veil the mysteries in its blue-green depths. The close ranks of hemlocks along with a few ancient beeches lining its banks add to the illusion of unreality, a Maxfield Parrish fantasy. This last may sound like a superfluous note, but even if a fisherman is not conscious of those things not directly connected to the taking of fish, they are a part of the picture which accentuates the pleasures even if fish are not in the mood.

The Caldwell has a great personality imparted largely by an abundance of character. Low hanging hemlocks and alders cooperate with the fish in much of its best water. Only the most skillful angler can place a nymph exactly where it will do the most good. There are shallow slides, and rough water deep enough to harbor its biggest trout; there are logs and huge rocks, the latter never failing to yield a trout or two when the fisherman floats a nymph or a feather minnow or an orange marabou down to where the currents meet below the rock.

I don't know of a fisherman who has fished this sterling stream without becoming completely enamored of it.

Select the best feature from a dozen favorite streams and the chances are you'll find them duplicated on the Caldwell well. On the rare occasions when it doesn't come through you can blame it on the vagaries of fishing. The fish are there. Now, do you wonder why I like it?—N. R. Casillo

*

The Little Black Caddis

Normally, the opening week of trout season is not regarded as an ideal time for a fly fisher to be abroad on the streams. The best hatches, and consequently the best fly fishing, rarely come on until early May.

Nevertheless, there is one fly common to many of our trout streams, especially in the northcentral counties, that is invariably on hand for the opener. His name is *Chimarra aterrima*—the Little Black Caddis.

This fly, strictly speaking, is not generally up in great abundance until the last week in April. But you can expect to encounter him in some numbers on the opening day. Whenever you see him, look for rising trout. He consistently sets the stage for early season fly fishing.

The Little Black Caddis is the earliest of the Caddis flies. He has numerous relatives, at least eight major species (plus dozens of sub-species) being common on our waters. He is a wee tiny mite of a fly, best matched by a size 16 or 18 dry fly. He is dark gray in color, has a smallish body, and outsized legs and feelers.

The wings are the distinguishing feature. They are trowel-shaped, and the upper edges join to form a sort of tent or roof over the body. These wings ride high and up right.

Like all Caddis, "blackie" emerges from a pupal casing of tiny stones or sticks. These stone and stick-type casings are often found attached to the undersides of flat rocks. The nymphs bite their way out of these casings, swim to the surface, shuck their nymph shells, and take to the air as winged flies.

Early in the season, the Little Black Caddis can be looked for when the water temperature is between 49° and 52°. After the first flies are observed, others may be expected to follow in flurries throughout the day.



"Why can't you come home with EXCUSES like other fishermen?"



The best hatches occur on breezy days of intermittent sunshine and cloud shadow. A series of on-again, off-again rain showers will help the cause immensely. A bright, sunny, clear day is no good at all. However, snow flurries seem to be no hindrance.

In fact, I have enjoyed excellent dry fly fishing in the midst of a snow storm when the Little Black Caddis was coming off.

Unlike the short-lived May fly, the Caddis may survive a week or so after hatching. On returning to the water, the female Caddis drops her eggs as she dips over the water. Some of the later species of Caddis swim or crawl beneath their surface to lay their eggs underwater.

Where the Little Black Caddis is concerned, the mating flight and return to the water are of minor importance compared to the hatch itself. Some Caddis shed their nymph cases and take to the air almost as soon as they reach the surface. But the Little Black Caddis, when he breaks free, frequently develops motor trouble. You see many of these tiny, fast-flying insects skittering along the surface attempting to get air-borne.

Most any dark-bodied fly in size 16 or 18 will take trout when they are feeding on this early Caddis. My own preference is the dry Blue Dun, size 18, and the Iron Blue Dun, size 16 wet.—*Jim Hayes*

*

When In Doubt . . . Go Wet!

"When in doubt, use wet flies!" I don't have any idea how many times really good trout fishermen have said this to me back in those days when the wet fly was considered, as it should be today, tops for taking trout.

No, I don't remember. Yet I do remember that, taking their advice, I often turned a dull day into a real wing-dinger, and did it so often that before too long I wasn't waiting until I was in doubt—I used wet flies!

Unless the trout were definitely feeding on a hatch, making the choice of dry flies imperative, or the stream was so high I knew no worthwhile lunker would pass up a chance at a fat minnow, I stuck to the sinkers.

Naturally, I passed this advice on to beginning fishermen just as it had been handed to me. With Rube Cross, Ray Bergman, Charlie Wetzel and a host of other "old masters" boasting that the wet fly method was the most killing way of taking trout they knew of, there wasn't much else I could do.

Yet, invariably, I found that after a few trips astream these fishermen would come around hinting that I was old fashioned in my ways, and sort of doubting that I did know anything at all about what it took to take trout on our streams.

It took only a few fishing trips with some of the doubters to point out to me where the trouble lay. These fellows weren't fishing wet flies—the items they were attaching to their leaders were monstrosities, regardless of what the tackle salesman told them when he took their money.

It was my contention then, and it still is, that any fisherman who fishes wet flies will take more fish throughout the course of a season than he will with any other method. If, on occasion, he can mix in a few dry flies or a fat minnow when conditions are right, so much the better.

But he must fish *wet flies*—and fish them right.

The fly must have a thin body and be sparsely tied. Eight to ten scrawny hair-hackles is enough at the front, and if there is a wing it should be lean. The best advice I can give in this respect is, tie your own flies and be stingy.

And, once you have the proper fly, attach it to your leader with a *thin* tippet. 4X, 5X and 6X are not too fine. These sizes will hold bigger trout than you'll ever catch on a heavier tippet.

Fishing the cast upstream, downstream, across, or however isn't going to make too much difference. Just keep dropping the cast over places where good trout hang out and you'll catch fish. Believe me—you'll catch fish!

—*Don Neal*

*

"The Littlest Pike"

Do you know there is a member of the pike family (Esocidae) that rarely exceeds a length of 14 inches. That's right, it occurs most abundantly in the French Creek and Lake Erie drainages. Many fishermen in these localities net these fish and secretly stock them in their favorite musky waters thinking they are young muskies. At a glance they look like a young musky, but by noting the tear-drop mark below the eye, one can identify these fish as mud pickerel (*Esox americanus vermiculatus*). The chain pickerel (*Esox niger*) also has this marking but it does not occur in western Pennsylvania, and neither the muskellunge nor the northern pike have such marks.

—*William E. Daugherty, Regional Fishery Manager*



Old photo—

Here is a snapshot of my fishing pal—Fred Schneider, taken in 1928 of a catch from Lake Wallenpaupack. These are BIG pickerel but would be ashamed to take that many now, even if we could (which we can't). Now fish only with flies.

—Floyd J. Waters (who also took the snapshot)

Bait Recipes

Carp Bait

- 2 cups yellow corn meal
- 2 cups white flour
- 1 cup sugar

Mix cornmeal, flour and sugar thoroughly. Add water to make thin paste. Pour paste in a cloth bag, suspend in a kettle of hot water. Bring water to boil, cook dough 1 hour. Be certain bag does not touch sides or bottom of kettle. Remove dough from bag, cut into quarters. Knead 1 quarter thoroughly. After all dough is worked place in one ball, wrap in wax paper. Dough will stay on hook for hours.

—Glenn Blauch, R.D. 1, Annville, Pa.

Catfish Bait

Grate pieces of "Horse Hoof" trimmings. Add flour and sprinkle this mixture over pieces of carp and let ripen in sun (Editor's Note . . . phhhheewwwwww!)

—Mrs. Irene P. Richwine, Lancaster, Pa.

Worm Balls for Bullheads

String worms on a thread, then wind into ball. Fasten line to center of ball. From a point 6 inches above ball, tie drop lines with baited hooks that fall around and remain close to worm ball. Fish on bottom.

Cut Captions to THE KIDS AND THE TURTLE

See—(November Issue)

Mr. Roy Shreffler: Harrisburg, Pa.

- 1—Back up . . . go around . . .
- 2—Low bottom.
- 3—He tickles . . .
- 4—Look out below!
- 5—Where did he go?
- 6—Come out and play!

Mr. Kenny Kyper—Age 7, Huntingdon, Pa.

- 1—Don't be afraid, little turtle . . .
- 2—My toy rabbit and little turtle making friends.
- 3—He has yellow and black on his stomach.
- 4—I never knew cement mixers mixed little turtles.
- 5—He's in his shell!
- 6—Come on out little turtle!

Mr. Myron Shoemaker, Laceyville, Pa.

- 1—Let's exchange ideas.
- 2—Get ready . . . get set . . . Go!
- 3—He's tired after the race.
- 4—Hiya fellows! Ready to play again?
- 5—Where's his head?
- 6—Oh! There it comes.

"HOLLAND" DUTCH FISH RECIPES

The "Holland" Dutch established in 1618 their first permanent settlement in Pennsylvania at Minisink Flats, near Stroudsburg. In 1623, a part of the territory of the state bordering the Delaware River was taken over by the Dutch as a section of New Netherlands.

As a contribution to succulent and flavorsome fish cookery these Dutch introduced the "Dutch" oven. This implement was a simple iron pot resting on short legs, topped with a heavy iron cover, the rim of which was turned up in order to hold live coals. The base of this oven also rested on a bed of coal. Such a homemade invention not only baked fish to perfection but cooked it also in its own steam while retaining all of the flavorsome pot liquor.

DUTCH HERRING SALAD

- 2 large smoked herrings
- 1 cup pickled red cabbage
- 1 cup fresh white cabbage
- 1 cup boiled potato
- salt, pepper, oil,
- vinegar to taste

Skin the herrings. Pick flesh from bones and mince it. Chop the cabbage fine. Cube the potatoes. Then mix all of the ingredients with the seasonings before serving.

SUSQUEHANNA SMOKED SHAD

- 1 pound smoked shad
- 1/2 cup water
- 2 tablespoons lemon juice
- 1/2 teaspoon sugar
- 1/4 teaspoon salt
- 1/8 teaspoon black pepper
- 2 tablespoons melted butter
- 2 tablespoons chopped parsley

Remove the skin and bones from the fish. Place prepared fish in a skillet, add the water, lemon juice, sugar, salt, and pepper. Cook over medium heat for 10 minutes to warm through and evaporate the liquid. Place slices of the hot fish on a heated platter. Sprinkle with melted butter and parsley before serving.

A farm boy on his first trip on the ocean was entranced by the heaving, mountainous waves.

"Terribly rough, isn't it?" remarked a stranger standing nearby.

"Wal," drawled the farm boy, "twouldn't be so rough if the captain would just keep 'er in the furrows."

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Sworn to and subscribed before me this 1st day of November, 1960	
(Signature of Notary Public) George W. Forrest (Signature of affiant, publisher, business manager, or owner) Myron P. Shoemaker	
[SEAL] Notary Public (My commission expires January 7, 1961) State Capitol, Harrisburg, Pa.	

Field Notes

Excuses! Excuses! Excuses!

Some people who violate the law can come up with the farthest excuses right off the cuff you'd wonder how they can be so agile in some things and so slow to catch on others. I was on boat patrol of Lake Wallenpaupack and as I came around a point, an angler, seeing me coming, started to reel in a line. As I approached the boat I saw he had two other rods in use. I asked him if he knew the law and if so why was he using three rods. The fisherman (alone in the boat) replied that he had left his wife use the rod and was reeling it in, got a back-lash which he was trying to get out. I asked why there was a worm on the hook and he replied the worm served as a weight so he could cast farther. He settled on a field acknowledgement.

—Warden Joseph E. Bartley, Pike County

What'ja Do With the Shovel?

I attended the ground breaking ceremonies for Allegheny Dam (Kinzua Dam) on October 22 last. When completed this body of water will cover 21,175 acres and the sportsmen of Pennsylvania will have one of the finest recreation areas in the U.S. The summer storage pool will provide a reservoir 27 miles long. Pennsylvania's own Governor David Lawrence was present as the speaker after which he was kept busy signing autographs for the kids. Everything went smoothly until the rites ended. Nobody could find the shovel used to break ground. After much scuffling around a man came forward with the diggin' iron saying he wanted it to get into the right hands for certain!

—Warden Kenneth G. Corey, Warren County

Clarion Fish Exhibit Well Received

The fish exhibit of the Pennsylvania Fish Commission was well received at the Clarion Leaf Festival, Clarion, Pa. the week of October 10th to 15th. Many school children and college students from Clarion State Teachers College enjoyed the exhibit. The public and the students took with them all the Fish Commission instructive and informative literature we had on hand.

—Warden Normal L. Blum, Forest and Clarion Counties

Quick, Gertie, the Flit!

Mrs. D. Kieffer of Chambersburg, R.D., Pa. was shaken up by her nine year old daughter's sudden desire to go fishing. After she had all equipment ready she took the fly swatter around the house in an orgy of fly gathering that astonished her mother who wanted to know what's what! The girl declared the place she wanted to fish had big signs hung up on trees that read . . . "FLY FISHING ONLY."

—Warden Bryce Carnell, Franklin & Fulton Counties

There's Always a First Time!

I apprehended a squirrel hunter before the small game season with two gray squirrels. He had them tied to his ankle with an old shoe string and was dragging them along the ground. If anyone came by he'd step on the string breaking it, walking on leaving the evidence behind. Then, he'd say he was out hunting woodchucks. He told me this was the first time his little scheme didn't work!

—Warden Bryce Carnell, Franklin & Fulton Counties

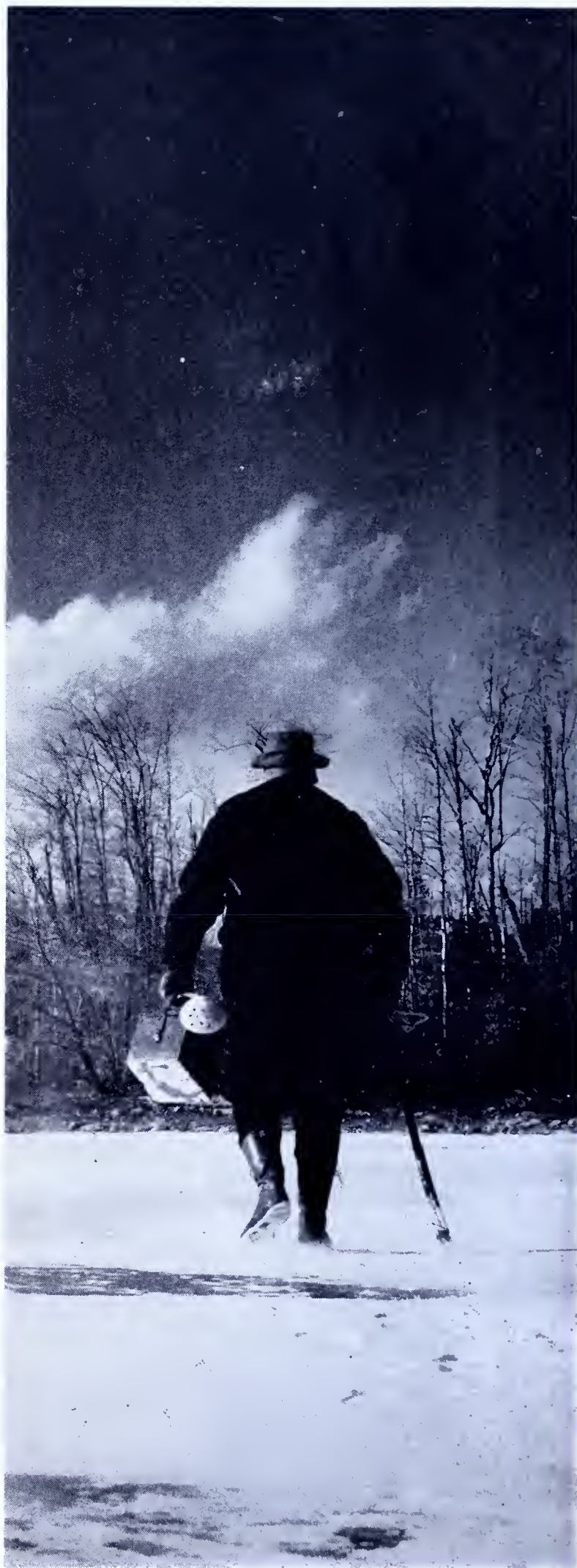
Brrrrrrr!

While on patrol of Conneaut Lake October 30, I saw a water skier still at it, swirling around the lake. In spite of rheumatism, ague and pneumonia, some guys just hate to give up!

—Warden Raymond Hoover, Crawford County

•
This world does not have an unlimited amount of space for an unlimited amount of people. We do not even have an unlimited amount of fresh water. There are those who seem to think the answer lies in ignoring it!

•
"30" is a mystic symbol that means the end for writers . . . and women.





PENNSYLVANIA ANGLER

February 1961



Conservation

Culture

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Techniques



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Review

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FEBRUARY, 1961



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GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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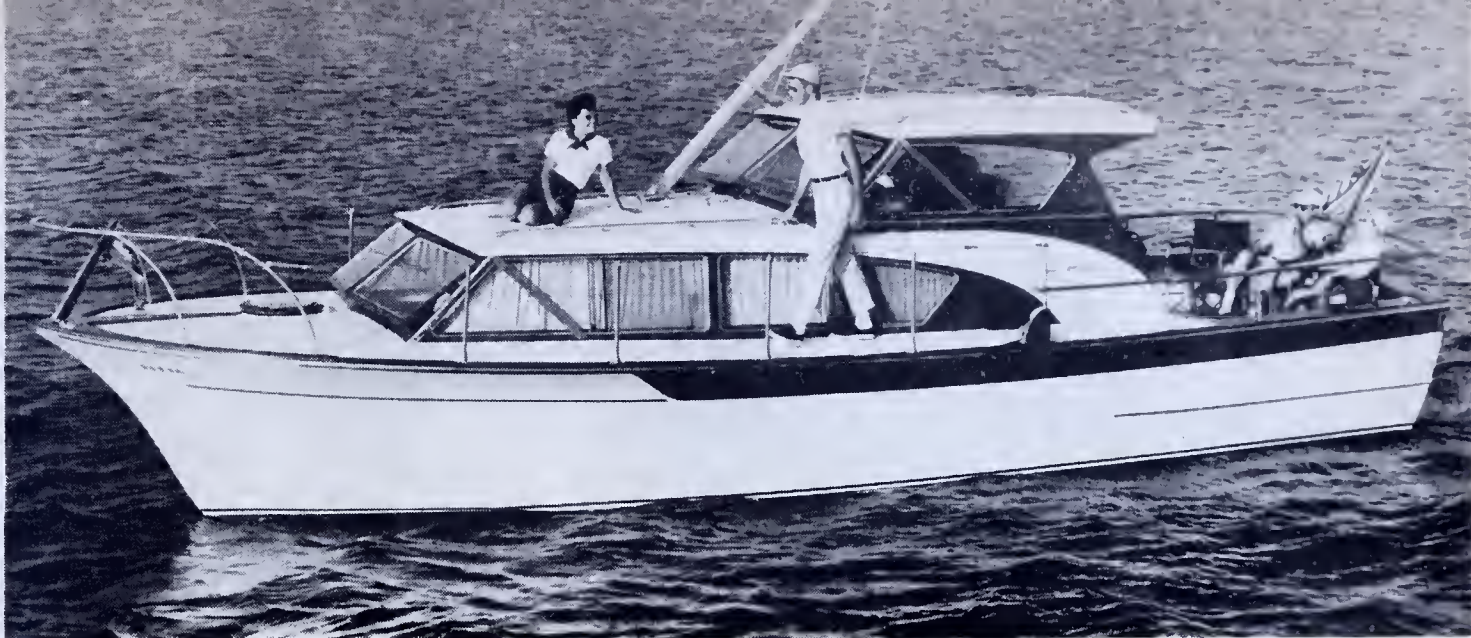
Perkiomen Creek near Hereford, Berks County

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NEW 1961 CRUISE ALONG . . . 33 ft. is available with sleeping arrangements for 6 adults; has solid African mahogany planking, batten seams, and 22 continuous frames of seasoned white oak, features a low, sleek silhouette, a wide flared Clipper bow, a 12 ft. 6-inch beam and 144 sq. ft. of cockpit space. Space is keynote of luxury here with 6' 4" of headroom and plenty of lockers and storage room.

Going To The Boat Shows?

TAKE ALONG THESE TIPS ON HOW TO BUY A POWER BOAT

■ If you're in the market for a power boat, what are the things you should know to insure that you "navigate" a good buy? Your choice of boat should be based on three factors: the amount of money you want to spend—both at the outset and in later maintenance; the kind of waterways available to you; and the purpose to which you want to put your boat.

Of the 7,800,000 recreational boats on all waters in the U. S. during 1959, about 6,400,000 had motors. Buyers in increasing numbers are finding that boating costs have come down and that you can float a power boat loan as easily as you can a car loan. Not only have improved manufacturing techniques brought boats within budget range, but the variety to choose from makes it certain that you will find the boat suited to particular need and purpose.

KINDS AND COSTS

Cruisers are the aristocrats of the power fleet. They start at 18 ft., 60 horsepower combinations, and can carry you on a weekend jaunt on your local waters, or extended off

shore cruising and down the Inland Waterway to Florida or up the Mississippi River. There is virtually no limit to the length of cruiser that you may buy, but for all practical purposes, a cruiser in the 25 to 33 feet class is probably your best bet. If the cruiser does not come fully equipped, it can be fitted with complete head and galley—ice box, stove, sink and storage space—as well as sleeping accommodation for two to six people in the cabins of boats up to 33 ft. long. Price range: \$2,500. to \$20,000.

Runabouts are an increasingly familiar sight on our nation's waterways. The runabout is a compromise between the comfort of a cruiser and the adventurousness of a rough-and-ready fishing skiff. Runabouts run about 14 to 21 feet in length and clip along fast enough to pull several water-skiers. The new models combine family comfort

with their sleek, dashing appearance, featuring a unique six foot sun lounge, luxuriously padded and upholstered, which folds conveniently and compactly when not in use. Standard equipment includes console drawers under the center of the dashboard for personal items, and a wrap-around safety glass windshield. You have the option of a ski tow ring, chrome stern boarding ladder, and permanent hardtop. Smooth riding and spacious, yet nimble and maneuverable, this "family fun" boat can do speeds up to 50 miles an hour.

Dories are a good bet, if you're interested in an off-shore fishing boat. While short on comfort, these unsheltered 12-18 ft. boats can't be beat for riding the surf and swells beyond. A dory is built to ride best with a heavy load and ranges in horsepower from 15 to 100 h.p. Price: \$500. to \$2,000.

A KEY TO YOUR PURCHASE

Naturally, no skipper would try to operate an ocean liner in a creek. In selecting a power boat, you have to consider the water you'll be navigating. On calm tides a light boat will do, but you'll need a heavier craft if you plan to sail the bounding main. On choppy waters you'll need stability; a boat with plenty of flare to the topsides will keep the spray out. On a placid bay, you may get better speed from a boat with a low, non-resistant silhouette.

SOMETHING SPECIAL

Outboard power boats cost less to buy and maintain. Inboards will cost you more, but you'll get what you pay for, in comfort and versatility. Except for very shallow and weed-grown waters, your inboard will navigate anywhere, and delivers a smoother, quieter, and more comfortable ride. Finally, it's about 20 percent easier on fuel than a comparable outboard.

If quality is your aim, you should look into the wonderful new things the boatmakers are doing with wood. African Mahogany, unsurpassed for beauty and durability, is the foundation material of many models of pleasure boats. Planks of mahogany in the hull may be subjected to ten separate stages of sanding, sealing, varnishing and glazing. The planks are hand-fitted to the hull framework, seamed water-tight with compound and fastened with non-rusting silicon bronze screws. Other materials besides quality mahogany which have contributed to the present boating boom are plywood, steel, aluminum and fiberglass.

A GOOD INVESTMENT

The initial outlay for a boat may seem steep to you, but remember that you're making an investment not only in family recreation, but in dollars and cents. Unlike automobiles, boats don't go out of style: after the first year's depreciation—20 to 25 percent—your boat, properly maintained, will hold its market value for a long time.

STANDARD MUSTS

Once you have your boat, what other expenses can you expect? The basic Coast Guard requirements for a Class I boat—16 to 26 feet long—call for a whistle, fire extinguisher, red and green bow light, white sternlight, adequate venting devices for inboard motors and adequate life preservers for each passenger aboard. These musts are

usually standard equipment on a new boat, but be prepared to part with \$50. to \$100. if you have to provide them yourself.

Good strong hawser line, an anchor, water pump to keep your bilges dry, first-aid kit, flares, a good government chart of your waterways—all these will prove invaluable. An average trailer handling up to an 18-ft. boat costs \$200. And you can count on spending between \$8. and \$10. a foot for May to October dock space. It's best to have your boat hauled ashore for the winter months—another \$150. for hauling and drydock space.

HELPFUL ACCESSORIES

While a standard engine will serve to propel your boat, you can improve performance and increase comfort, convenience and engine life by adding a few accessories.

Special "booster" devices and auxiliary fuel pumps help your boat engine to start up quickly after it has been inactive for a long time.

A muffler, designed for size and kind of boat and engine, will take the roar out of an open exhaust line. This will not only put pleasure back into your boating; it will enable you to hear the whistle signals of other boats during a fog.

An hour meter serves your boat the way a speedometer does your car: it runs when the boat engine is running and tells you how long the engine has been operating since the last service job.

COURSES IN PILOTING

A few outings with an experienced friend will help you to cut your navigation eye-teeth, and you'll be ready for some short cruising on your own. Also, a remarkable amateur organization known as the U. S. Power Squadrons offers a ten-week course in piloting, seamanship and small-boat handling in some 232 cities throughout the country, absolutely free. The USPS certificate and the flag you're permitted to fly when you complete the course testify to your competence to handle your boat under almost any circumstances or weather conditions.

There's another certificate you'll want to have, called an SBBC—Smart Boat Buyer's Certificate. You can earn it, and fly the flag of Happy Boating besides, by letting the "channel-markers" in this story be your guides.

—Courtesy Century Boat Co.



The Sturgeon

in Pennsylvania

PART II

BY C. ROBERT GLOVER

*Pennsylvania Fish Commission photos
By Johnny Nicklas*



LAKE STURGEON approximately 5½ feet long, taken from Lake Erie in the nets of Fred Ralph, commercial fisherman. This one after recovering in an awaiting tank truck was transferred to one of the fee fishing ponds that dot Pennsylvania. Photo by Johnny Nickles.

(Part I of "Sturgeon in Pennsylvania" appeared in the January issue of the ANGLER. In it, the species was traced back to its probable origin some 3¼ million years ago; the four members of the sturgeon family present in the waters of the Commonwealth were located and described, up to the point where exploitation and environmental changes brought it to near extinction in our waters, and artificial propagation.)

■ In reporting the experiments made by a Dr. John Ryder in the direction of artificially spawning and hatching young sturgeon, the bulletin of the United States Fish Commission in 1890 contained the following: "The majority of the roe fishes which are brought to the butchering floats are not ready to spawn. The nearly mature roes of such fishes are hard and firm and have not yet escaped into the general cavity of the body. The roes of such individuals are known to the fishermen and caviar dealers as 'hard roe' and are most prized by the packers of caviar. Another kind is that which is most valuable to the fish culturist, that which is just maturing and ready to be artificially fertilized."

This early report was quite lengthy and detailed in relation to Dr. Ryder's experiments. His efforts, however, were fruitless. Even when he did succeed in obtaining fertilized eggs, fungus developed and made tremendous inroads on them in the hatching process. The few that were hatched were set free in open water. But the results were so minimal that the effort put forth was not deemed to be worthwhile. Much the same unsatisfactory results came from similar experiments being conducted simultaneously in Germany.

Lake Erie Sturgeon Fishery

In a recent study he made of the sturgeon fishery in Lake Erie, Alfred Larsen, the Fish Commission's research biologist assigned to that body of water, disclosed that the record catch was made there in 1885, when 4½ million pounds were taken. From 1880 to 1903 the average annual production was approximately 1-¾ million pounds. It dropped to approximately 15,000 pounds by 1934. Understandably in view of this, the sturgeon is now considered commercially extinct in Lake Erie.

Efforts were made by the state of Ohio in recent years to effect a measure of protection for the species. For 5 years Ohio law prohibited taking them. However, neighboring states and the Province of Ontario failed to concur and the protection was lifted. Present commercial fishing regulations require that a sturgeon must be at least 48 inches before it may be kept.

Even with that, there is little indication of a recovery of its population. For the most part those which do appear in the nets of commercial fishermen today find their way to the fee fishing ponds in western Pennsylvania, a facility of fairly recent origin.

Fred C. Ralph, a veteran commercial fisherman at Erie, Pennsylvania, writes: "The first sturgeon to be placed in such a pond took place around 1940 in a pond near Mercer. As more of these lakes came into being, it was quite common to have sturgeon stocked because they always served as an attraction. And although seldom landed, they would take bait at times.

"Most of the lake operators preferred to pay a cash award to the lucky fishermen and have the fish returned to the water. The re-action of these sturgeons when put



REVEALING PICTURE of a Lake Sturgeon, one of several in the Fish Commission's collection at its Pleasant Gap station, in the close confines of an aquarium. Note the unique features of the specimen—the barbels, position of mouth, plates and nodules, and the far-back location of the dorsal and anal fin. Photo by Johnny Nickles.

into water unfamiliar to them is quite varied. Some put on quite a show by breaking the surface and jumping. Others would never be seen. Some would take bait quite often, others not at all. Some continued to grow normally, others would cease to develop."

Roe For Caviar

Unquestionably, today, the sturgeon is looked upon from the standpoint of its roe, which after processing becomes caviar. The quantity of eggs taken from a single fish will range between 5 and 15 gallons, depending upon its size. It has been estimated that in a gallon there will be approximately 168,000 eggs. Close to 2½ million, therefore, are realized from the larger fish.

Delaware River Sturgeon Fishery

An idea of the tremendous numbers of sturgeon which in the spring would move into the lower Delaware can be gleaned from a report filed by the Pennsylvania Fish Commission in 1896, which in part stated, "Men not yet 60 years old say that even before they passed their majority, it was not an uncommon sight to see several sturgeon during a single trip between Camden and Philadelphia jumping in the river. These same men say that when they were boys, while on shad fishing trips in the Lower Delaware, they saw thousands of sturgeon.

"On one such trip it became necessary to take in their nets with great speed in order to save them from utter destruction. As it was, many fathoms were badly torn by the fish. The sturgeon passed their boat in such vast numbers that in a little while the occupants had killed and secured 11. This was as many as they could take home. As the run continued, they slew many more on the principle that it was a fish not only of scarcely any value, but was actually a nuisance in the river on account of the damage caused the shad nets."



CUTTING ROE from an Atlantic Sturgeon taken from the lower Delaware River in 1893. Photo is a re-production from the "Report of State Commissioners of Fisheries," Pennsylvania, 1899.

In a historical account of the sturgeon fishing industry along the Delaware River, John Fennimore, a relative of novelist James Fenimore Cooper, was recorded as a sturgeon fisherman with nets at Dunk's Ferry near Bristol, between 1820 and 1835. He would sometimes take 25 or 30 in a single haul, with a 12 inch mesh net, when working over a bar near the Pennsylvania side. The fish, however, seldom brought more than 30¢ a piece and sometimes as low as 12½¢.

Though available records do not follow the enterprise through the ensuing years, it is deemed to have been continued because in a History of Chester, later in the century, it was noted that besides the small fisheries for sturgeon in the neighborhood of Dunk's Ferry, one was established about 1873 near Chester, "by which time the activity as a regular industry in the river below Philadelphia, at least on the Pennsylvania side, was not more than 12 years old." The historian wrote, "As far as can be learned, the first effort in this (the Chester) enterprise was made by Henry Schacht, who sometime ago, with scant means and but one boat, located himself on Ridley Creek, from which place he removed to Chester Creek and afterwards, with wise forethought when more prosperous, purchased Monas Island, opposite Chester. There by means of piles, etc., he erected a pen in which to retain the fish alive for a more profitable market.

"Mr. Schacht was drowned on a dark and dismal night and a relative, Henry Hadley, succeeded to the business which has greatly increased.



SKINNING an Atlantic Sturgeon at Bayside, N. J. Photo is a reproduction from the "Report of State Commissioners of Fisheries," Pennsylvania, 1899.



PORTION of the sturgeon boards (docks) at Bayside, N. J., where over \$1 million was invested in the early 1880's in the short-lived commercial fishery operation there.

"At the foot of Edgemont Street is moored a large scow, well arranged for the comfort of those employed. There are bunks for their sleeping arrangements and a cook for their meals. . . .

"Mr. Hadley has six boats engaged, which are substantially built, averaging 25 feet in length. The fishermen are paid \$1.75 for sturgeons they capture. They sometimes realize from \$20 to \$30 a day. . . .

"Besides the industry at Chester, another one grew up at Bayside, N. J., in which there is now invested more than \$1 million. . . .

"In 1880 the market for sturgeon meat and eggs for caviar had not yet assumed great proportions. The river still teemed with the fish and not all that were caught could be disposed of. Between 1880 and 1884 it was not an uncommon thing to see from 1,000 to 1,200 sturgeon on the wharf at Bayside, N. J. at one time. Today (1896) 25 or 30 is such a rarity that its happening is sure to bring fishermen from miles around to see them."

During the same four year period (1880-1884), it was not uncommon that 5 to 6 cars loaded with sturgeon and caviar were shipped to the market of Philadelphia and New York from Bayside. By 1899, if 5 or 6 boxes were shipped in the same time, the shippers felt they were lucky.

Between 1880 and 1890, when sturgeon were still available and before the value of roe was fully appreciated, prices for roe were very low. In 1882 roe brought from \$3 to \$6 a keg. In 1884 it sold for \$9 a keg and by 1889

a keg brought as much as \$110. The records of one firm in 1899 showed 96 sturgeon caught, which realized \$3,923.25, the fish bringing \$672 and the caviar \$3,251.25.

Other Sturgeon Fisheries

The fate of the sturgeon fishery on the lower Susquehanna River paralleled those of Lake Erie and the Delaware River. And for the same general reasons—overfishing and waste and pollution. The dams now on the Susquehanna of course, were no factor because they were not in existence then. In any event, the sturgeon fishery there, had disappeared for the reasons mentioned above, a quarter century or more earlier.

And though in the early days of the Commonwealth there was a sturgeon population in the Ohio River and its tributaries, as stated earlier, it was never of any commercial import.

What are the prospects for the future? With the gradual and undoubtedly eventual elimination of pollution, it is reasonable to assume that a comeback of the species can be anticipated, with those present serving as brood stock. Only time will tell that.

Too, it can be presumed that once there is indication that improved environments will be to the liking of the sturgeon, modern management methods will be applied by the agencies concerned.

How important from the truly commercial standpoint they could become, is equally hard to visualize in view of the vastly changed times since the sturgeon was an important economic factor in the communities within their limited range.

However, it does fire the imagination, of a sport fisherman, at the thought of playing tug-of-war with something up to four or twelve feet long almost anytime he feels up to it during the several months of each year they would be present in number. Boy-o-boy-o-boy!

Do Trout Species Compete?

By **KEEN BUSS**
Fishery Biologist
Pennsylvania Fish Commission
Benner Spring Fish Research Station

*Pennsylvania Fish Commission photos
By Johnny Nicklas*

EFFECTS of competition. From top to bottom: Brown trout, brook trout and three stages of emaciation of rainbow trout.



■ Suppose you as a sportsman had a limestone trout stream about half-a-mile long that you wanted to stock with fingerling trout because no adult trout were present. This stream maintained its flow at about 9,000 gallons per minute and averaged about 12 feet wide and 3 feet deep. Now the question arises, what species of trout should you stock? To be on the safe side, you decide to plant all three species—brook, brown and rainbow trout. Now that you have decided to stock all three species, you go to your local commercial hatchery about the first of June and buy 20,000 fingerlings of each species. Since trout species have different growth rates and different hatching times, you find that the rainbow trout average 4 inches long, the brook trout average 2-¾ inches and the brown trout about 2 inches in length. “Curses,” you say, or a little stronger, “those big rainbows are going to eat my little brown trout.” Since you already bought the trout, there is no backing out, so you stock your stream. It’s a long fall and winter and the next spring you want to check your stream to see how they survived, but you decide to give them a full year, so you decide to wait ’till June. What will happen? Did the rainbows eat all your brown trout? Let’s look at a similar experiment.

One answer to this perplexing question was furnished from an experiment conducted at the Benner Spring Fish Research Station. The situation was exactly as outlined above except that the experiment was run in a dirt raceway supplied by stream water. Food for these fish occurred naturally in the raceway. This should have made a good test of the competition between the species.

After one year in the raceway, only 19 brook trout were recovered. Remaining brown trout numbered 4,536, while 7,926 rainbow trout were still alive. However, these figures were misleading. Even though the rainbow trout outnumbered the brown trout almost 2 to 1, it was doubtful whether many rainbow trout would have survived another year. They were very emaciated and had only grown about one-half inch. Only about half the poundage was recovered that was planted. On the other hand, the brown trout were in excellent condition. They had grown about two inches and had increased in weight about six times over their weight at planting time. It is obvious from the 19 survivors that the brook trout just couldn’t compete. The condition of the brown trout seems to indicate that in another year they would have been the dominant species.

The results of this experiment do not indicate that brown trout will always dominate. It indicates that certain water areas are better suited for one species than



RAINBOW TROUT (left) were razor-thin while the brown trout (right) were normal healthy fish.

the other and under these conditions species do compete. For instance, in the Fish for Fun stretch of the Left Branch of Young Woman's Creek where no trout can be killed there are three different species combinations. In the lower one-third, brown trout are the predominant species. In the middle section brown and brook trout are found in equal numbers. In the upper one-third or headwaters, the brook trout is the predominant species. Obviously, there are conditions in certain sections of this one stream that are better suited for one species than the other. These differences are also found between streams.

Now that you know the results of your fingerling stocking, how do you go about determining which species of fingerling trout you should stock? First, if adult trout are present, which species is predominant? If stocking is needed, it would be best to plant fingerling trout of this species. Second, brown trout usually do best in limestone water or waters which become quite warm. Never mix brown trout and brook trout fingerlings. These two species are usually competitive. Brook trout will usually do better in cold headwater streams. Never plant rainbow trout fingerlings or adults in streams that have natural acidity. Brook trout do best in these situations.

What have you learned from your experiments? You have learned that trout species do compete and one species may be better adapted to a water area than another. Therefore, in the future you will plant only the fingerlings of one species which will survive and produce the good fishing you wanted.

HOG of the Waters

*Hops and Turkeys, Carps and Beer
Came into England all in a year.*

By S. CARLYLE SHELDON
(Regional Warden Supervisor)

■ When the Pymatuning Lake was first filled in 1934 and 1935, the large carp, which were in the Shenango River before impoundment, found ideal conditions for spawning and the fact that no game fish were present to prey on the young carp, they soon multiplied by the thousands and as the small carp grew they showed a tendency to congregate below the spillway in large numbers. By 1939 there were so many in the bowl that it was almost solid with fish and anything which was thrown in the water was eaten.

A Mr. George Ennis of Linesville was one of the first to conceive the idea that people would buy bread to feed the carp and in those days there were several bakeries in Pennsylvania and Ohio which had stale bread in substantial quantities each week. Others got the same idea and at times there were as many as four groups of people selling bread at the same time and the competition became so spirited that on one or two occasions it became necessary to call the State Police and settle disputes among the bread salesmen. I personally recall one incident where one party pushed over a cart belonging to another and 500 loaves of bread were spilled into the water at one time, which made only the carp happy.

In the mid forties the Pennsylvania Department of Forests and Waters could see that something must be done, so they built a concession stand and put it out for bid to the highest bidder. Mr. Ennis was granted the concession and his son is still operating it today.

We do not have accurate figures on the number of people who visit the spillway, but we do know that in the summer of 1953 there were 178,000 loaves of bread, sold and fed to the fish which did not include the bread that tourists brought with them.

Fishing is prohibited in the immediate area as it is felt that it would be dangerous to the spectators and would cause added congestion along a busy highway and railroad.

The Pennsylvania Fish Commission is charged with management of the fishery in Pymatuning and from time to time the surplus carp are removed and shipped to quarry ponds where the water is unsuitable for other species.

No effort has ever been made to encourage carp production, on the contrary, we are thinking that in the future it will be necessary to drastically reduce the numbers of carp in the entire Pymatuning Lake so that the excellent game fish population which now populates the lake will not be impaired.



THE PUMPKINSEED or common sunfish. Pumpkinseeds have red margin on gill flap not shown on photo.

The Age and Growth of the

PUMPKINSEED

in Pennsylvania

PART V

JACK MILLER and KEEN BUSS
Fishery Biologists
Pennsylvania Fish Commission
Benner Spring Research Station

Pennsylvania Fish Commission photographs by Johnny Nicklas

■ The pumpkinsced in this story is not vegetable but animal. In fact, it is too much animal. It infests many of our water areas like the locust plagues of ancient Egypt. Not necessarily devouring everything before it, but reproducing and crowding until all of its finny counterparts suffer from the effects.

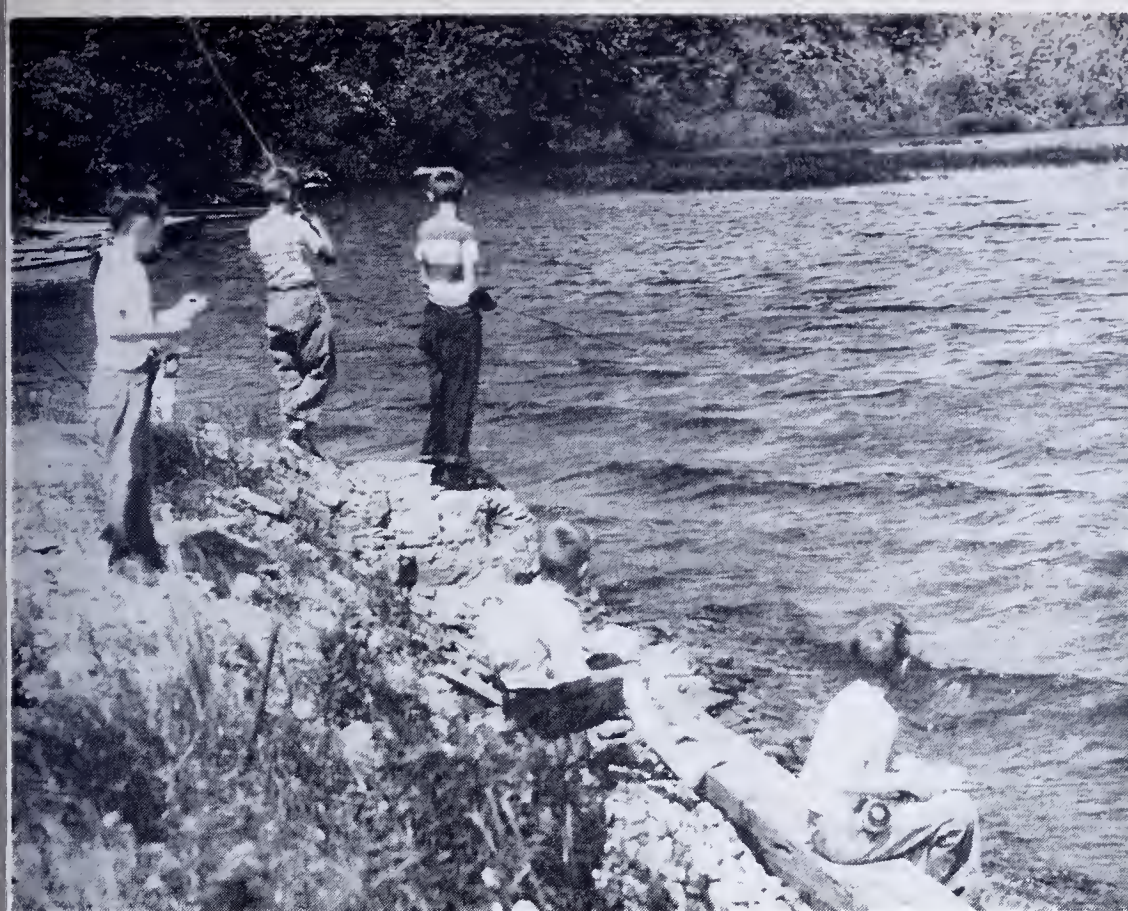
The pumpkinsced is the common sunfish—common in almost all of our warm water areas. It is the colorful sunfish with the bright red margin on the gill flap. Technically, the fishery men call it *Lepomis gibbosus* and have universally adopted the common name of pumpkinseed. To many people it is the prototype of all sunfish, and sunfish is what it is commonly called.

Probably no other fish is as widely distributed or dominates our warm water areas in Pennsylvania as does the pumpkinseed. Luckily, although the growth is slow, enough fish reach catchable size that they provide some fishing. Some lakes provide relatively good pumpkinseed fishing.

In others, they become so numerous that the largest individuals are not more than four inches. In a lake in Susquehanna County they became so abundant and stunted that they spawned when only about three inches in length. The nests were about the size of saucers and were placed within inches of each other. These sunfish became so plentiful that when the young children were swimming in the vicinity of the nests, the pumpkinseed continuously pecked at their legs. Sound like a fish story? It is—it is a true story of too many fish.

When the pumpkinseed become over crowded they not only stunt themselves but play havoc with the growth of the other associated species. They compete for food and space normally required by the young of other more desirable species. In some cases they will actually dominate a water area. The introduction of this species into a farm pond will soon prove this point.

The growth-weight relationship of the pumpkinseed is



IT'S pumpkinseed time.

similar to the bluegill. Listed below are some approximations of this relationship.

<i>Length in Inches</i>	<i>Weight in Ounces</i>
4	1.0
5	1.5
6	2.5
7	4.5
8	6.0

Listed on Table I are the growth of the pumpkinseed for fourteen lakes in Pennsylvania. It will be noted that about an inch a year is the average growth in many lakes. Slow growth and good reproduction adds up to a nuisance fish, and this is the status of the pumpkinseed in many lakes in Pennsylvania.

TABLE I
Average Calculated Total Length at Each Annulus for
Pumpkinseed in Fourteen Pennsylvania Lakes

<i>Name of Lake</i>	<i>County</i>	<i>Number of Specimens</i>	AGE									
			I	II	III	IV	V	VI	VII	VIII	IX	X
Duck Harbor Pond	Wayne	59	0.7	1.4	2.3	3.1	3.9	5.2	5.9	6.4	7.3	7.1*
Peck's Pond	Pike	17	1.1	2.6	4.1	5.3	6.0					
Lake Idlewild	Susquehanna	62	1.1	3.3	4.6	5.4	6.0					
Quaker Lake	Susquehanna	62	0.7	2.2	4.1	5.3	5.9	7.2				
Lake Winola	Wyoming	42	0.6	1.9	3.2	4.8	5.7					
Lake Clarke (Susquehanna River)		17	1.6	4.1	5.3	6.1						
Silver Lake (Bristol Pond)	Bucks	27	1.0	2.0	3.0	3.6	4.1	4.2	4.6			
Tingley Lake	Susquehanna	41	0.8	1.9	3.7	5.0	6.6					
Greeley Lake	Pike	37	0.8	2.1	3.2	4.1	4.8	5.2	5.6			
Lake Lorain	Wayne	28	0.8	2.3	3.6	4.2	4.8	5.5				
Brady's Lake	Monroe	99	0.8	2.3	3.5	4.4	5.0	5.8	6.5			
Cowan's Gap Dam	Fulton	57	1.1	2.6	4.0							
Bridgeport Dam	Westmoreland	46	1.1	2.8	4.2	5.1						
North Jersey Lake	Monroe and Wayne	29	1.1	2.5	3.8	4.6	5.2	5.4				

* Based on one (1) specimen.

Gas Bubble Disease in Fishes

By ARTHUR D. BRADFORD,

*Asst. Chief Aquatic Biologist, Benner Spring
Fish Research Station, Pennsylvania Fish Commission*

Johnny Nicklas photos

■ We have all heard of Popeye, the sailor man, but did you ever see a pop-eyed fish? This is a disease in which the eyes of a fish protrude or bulge outward much more than normal.

Deep sea divers and under-river tunnel workers often suffer from a disease called "bends" which is caused by excessive air pressure necessary to work in great depths. When such workers return too rapidly to the ordinary atmosphere, gas bubbles appear in the blood stream and may cause temporary paralysis or even death. Fish placed in certain limestone springs or in water under high hydrant pressure will also develop "bends."

The malady in fish is known as "gas bubble disease" or "gas embolism" and one of the most common symptoms is protruding eyes or "popeye." Gas collects in back of the eye socket and pushes the eyeball outward giving a pop-eye appearance. Gas bubbles can often be seen in the small blood vessels in the fins or on the body surface.

Fish hatcheries having large limestone springs as their water source often must aerate the water thoroughly before passing it over fish. Aeration removes the excess gases and prevents loss of fish due to gas bubble disease. Aquaria owners who use running tap water may also run into this disease problem because of high pressure of the city water supply. Aeration may also be necessary in such cases to prevent loss of fish.

When fish are pulled rapidly from great depths (50 to 60 feet or more) popeye and bloating may be observed. This is caused by removing the fish too rapidly from a region of great pressure (deep water), to a region of low pressure near the surface. The fish adjusts to the great depth by equivalent pressure in its air bladder. Thus when they are pulled rapidly to the surface they are unable to compensate quickly to the change and may literally "blow up."

Popeye symptoms may have other causes than gas bubble disease. Nutritional disturbances often cause the condition to appear in hatchery fish. Certain parasitic infections can also cause popeye.

The next time you see a pop-eyed fish you will know there is a reason for this abnormal condition and probably the most common reason is gas bubble disease.



FINGERLING trout showing a typical popeye condition caused by gas bubble disease.



BOTTOM VIEW of a slimy sculpin or "miller's thumb" showing severe gas bubble disease. Note large bubbles just under the skin. This fish was collected in a limestone spring.

Wrightsville Access Area Popular

With Susquehanna Anglers

■ In November of 1958, an agreement between the Safe Harbor Water Power Corporation and the Pennsylvania Fish Commission was executed. This agreement covers the use of 10.8 acres of land along the Susquehanna River at Wrightsville, York County, as a public fishing access area. The access is immediately south of Route 30, "Intercounty Highway Bridge" and parallel to the old "Tidewater Canal" on the east side of Front Street in Wrightsville.

It's easy accessibility to the fishing public makes it an ideal location and throughout the season as many as twenty-five to fifty fishermen could be counted along the river banks with as many cars and trailers in the parking lot.

The development of this area by the Fish Commission's engineers began in July of 1959 with the construction of an access road, boat launching ramp and a parking area to accommodate 50 cars and boat trailers. This past summer numerous "Location Signs" were erected, along with over 300 feet of steel cable for use as a boat mooring line. Future plans for the area include sanitary facilities, drinking water and a concrete boat ramp.

The Safe Harbor Water Corporation deserves much credit for making this area available to the fishermen. Mr. Carl Lefever, their property agent, being most cooperative in expediting the negotiations on this lease. The agreement is for a period of ten years at an annual rental of \$1.00 per year.

This is one of the many access areas the Fish Commission is acquiring, developing and maintaining on rivers, lakes and streams throughout the Commonwealth, and is a part of a continuing program to provide access to existing waters for the general fishing and boating public.

*—prepared by personnel of Real Estate Division,
Pennsylvania Fish Commission*

Johnny Nicklas photos



BOATS AT ANCHOR near launching area at Wrightsville. Ye Ed uses this ramp quite often and can, eye witness, say its plenty convenient for the angler.



WRIGHTSVILLE ACCESS area along the Susquehanna river is easily reached from Lincoln Highway, Route 30. Constructed in 1959, it has become one of the most popular areas for sportsmen in a five county section. Clean gravel parking lot, plenty of shade induces families to picnic, boat and fish from this point.



WHEN THIS ANGLER appeared with a box strapped to his shoulders, he was the envy of every angler on the frozen pond.



BOX CONTAINED all his fishing equipment: folding ice-chisel, tip-ups, bait, hooks, lunch, radio and canvas wind shelter.



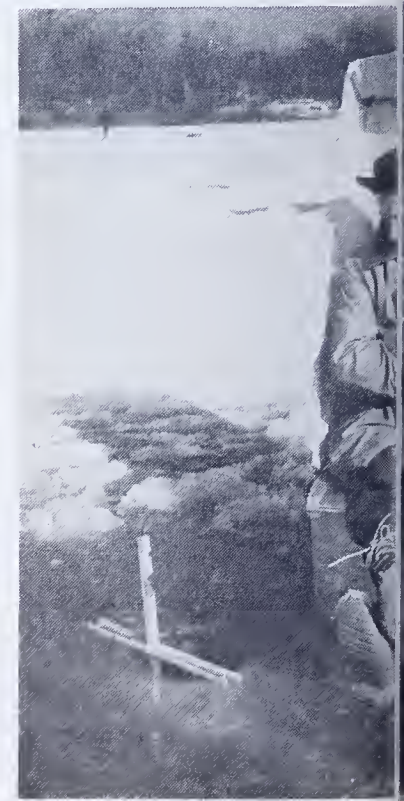
FIRST OPERATION included assem to the box.



IN SECONDS FLAT, the shelter was erected.



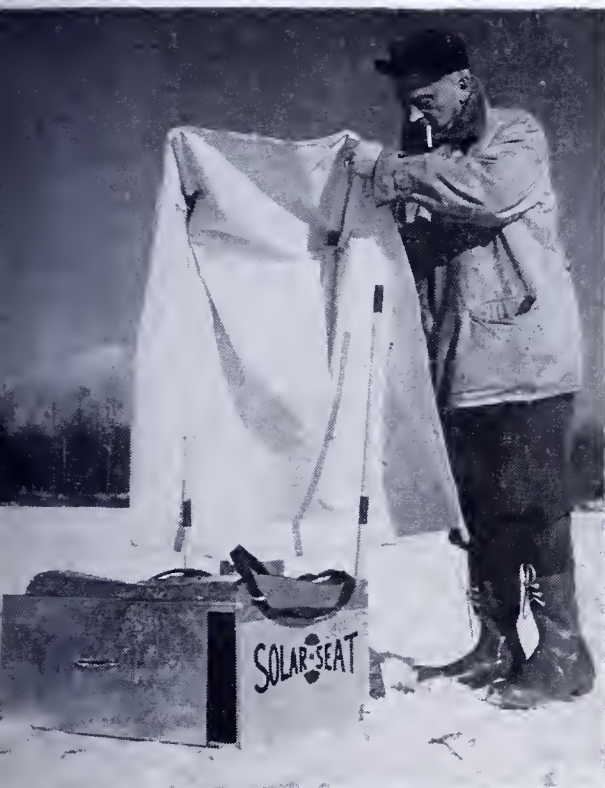
A CONTAINER of "canned heat" was lighted and placed inside box. Metal door was closed so that the burning "heat" could simmer slowly.



AFTER SETTING ice tip-ups in posi laxed in southern comfort.

Ice Fishing

N SHINER



CANVAS COVER was unfolded and placed over dowel supports.



AND HERE'S the size of the nice pickerel he was catching.

■ One particular ice fisherman was the envy of every angler on frozen Sylvan Pond in northeastern Pennsylvania. We were seated comfortably near a roaring fire on shore, squinting through binoculars at our far off tip-ups, when this particular fisherman walked into the scene. A back-pack was strapped to his shoulders. Sizing up the pond picture, he selected a nearby wind swept part of the ice for his operation. Much to our dismay, he unslung his pack and began unfolding a combination seat and wind breaker that provided him with real southern comfort on this cold January day.

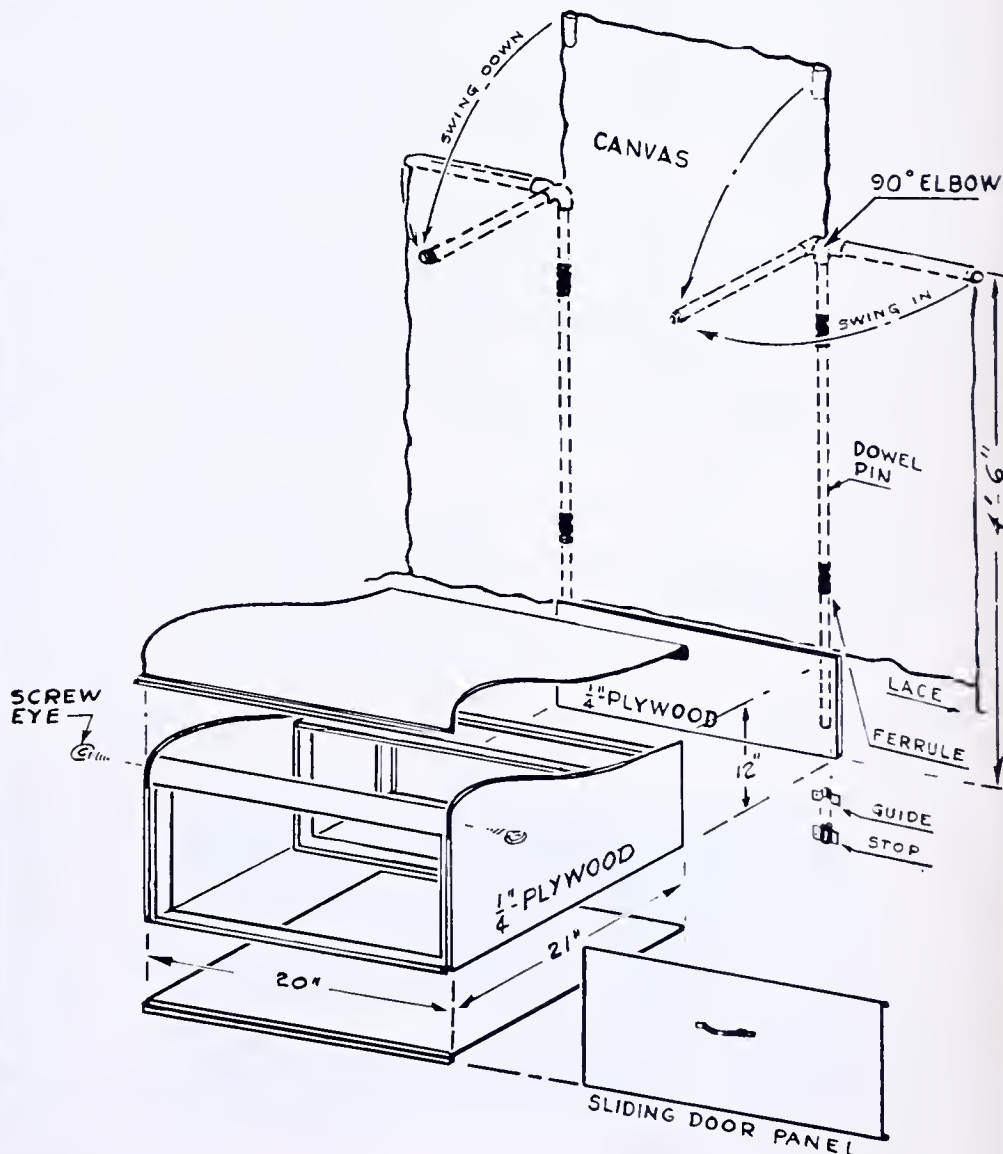
The box contained all his necessary ice-fishing paraphernalia—tip-ups, lines, bait, hooks, lunch and coffee, several containers of canned heat, portable radio, and a sturdy canvas canopy that assembled into a wind breaking shelter. After assembling the canvas shelter, he lighted a container of canned heat, and placed it inside the box. Then he went to work chopping ice holes, baiting tip-ups and setting them into position.

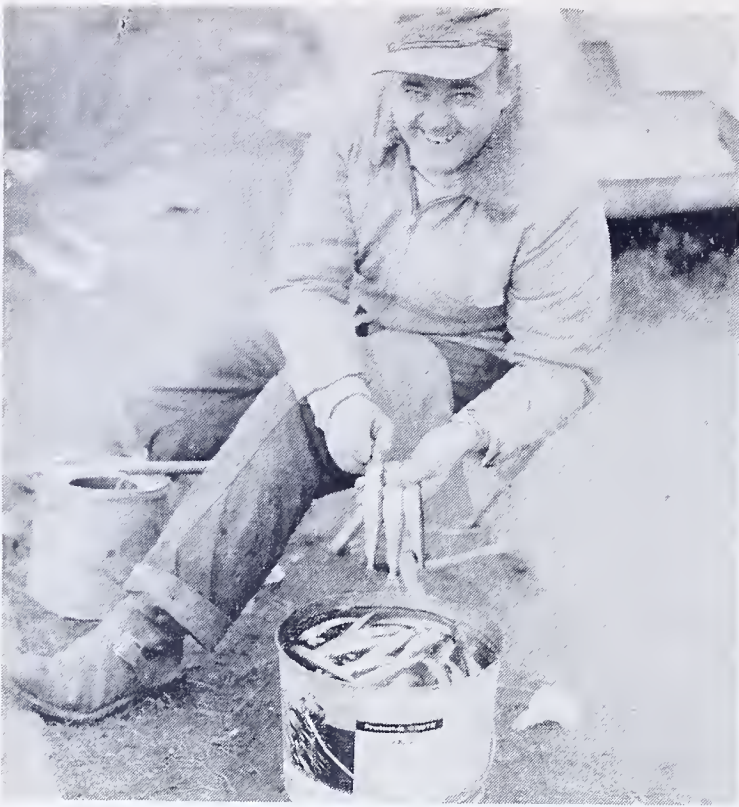
Wasn't long until he began catching fish. While we made fifty yard dashes from shore toward our waving flags, frequently arriving too late, this ingenious fisherman relaxed in the midst of his tip-ups and was ready for immediate action. He was able to concentrate on ice-fishing instead of the cold, zero temperature. His box-like seat kept him warm as fresh toast. The canvas shielded him completely from the chilled wind. He sipped hot coffee while listening to the latest news programs. We smoke-drenched, fire sitters agreed, this angler's ingenious hot seat took the frost bite out of winter ice-fishing.

Plans here show how a similar ice-fishing hot seat and wind breaker is assembled. Materials include canvas, 1/4-inch plywood, 1 x 2-inch framing, galvanized sheet metal, wood dowels and copper tubing ferrules. Cost runs about five or six dollars—a small investment in view of the big comfortable dividends it gives to icemen.

Build one of these hot seats for the next ice-fishing jaunt. You've got a real treat in store!

EXPLODED PLAN drawing shows how the ice-fishing hot seat is constructed. If you like ice-fishing, you'll like this comforter!



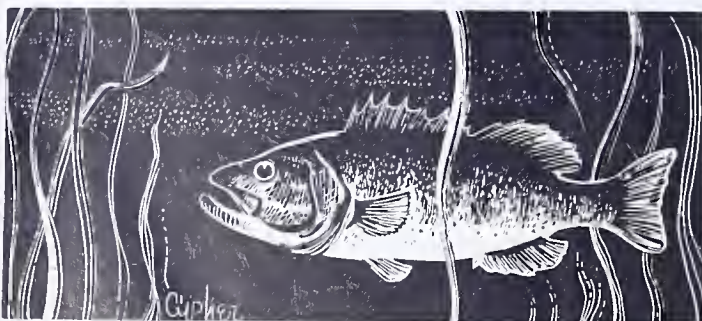


Happy Lake Erie Smelt Fisherman

And who wouldn't be pleased with a catch of 89 delicious smelt from 7 to 9 inches in length in just under two hours fishing time! Jack Fallon, 444½ West Third Street, Erie, Pennsylvania, caught these smelt off a popular fishing pier in Presque Isle Bay on November 18, 1960.

Schools of smelt have begun moving in from Lake Erie into Presque Isle Bay where they are being caught in large numbers by local fishermen such as Mr. Fallon. Hook and line fishing for smelt in Presque Isle Bay has been a relatively recent development. In the past, by far the greatest catch in Presque Isle Bay, both in numbers and pounds, has been yellow perch. Now, during the fall and winter, fishermen have been catching as high as 100 to 1, smelt over yellow perch.

When the smelt fishery first developed in the bay, many fishermen discarded the smelt they caught—probably for no other reason than that they were expecting to catch perch. Now that the fine eating qualities of smelt have finally been recognized, the fishermen are as eager to fill their pails with smelt as with perch.—*Alfred Larsen, Fishery Biologist, Lake Erie Station, Erie Pennsylvania.*



Sometimes a fishing stream, like an aged apple tree simply bursts into bloom and starts producing without anything to explain why it hasn't been doing the same thing consistently over the years. Yes, suddenly, as if it had taken a new lease on life, it gets to be as virile and opulent as its most dedicated admirers have always claimed it to be. This is the case of the Brokenstraw Creek up the northwestern part of Pennsylvania.

For years this stream has ranked with the best as an early season trout stream. But as the waters warmed and its brown and rainbow trout moved into the feeder stream in search of cooler waters each season the fishing for the warm water species just never seemed to pay off, so the Brokenstraw anglers moved off to the more productive waters of the Allegheny River. Over the past two years though, this has changed. Now, the Brokenstraw is making a name for itself as a topnotch smallmouth bass stream, and above all, as a place to go if you want to tangle with some really sizeable northern pike.

The bass in the Brokenstraw can be accounted for, undoubtedly, because of the upswing in the species' population that has occurred in the Ole Allegheny over the same period of time. With the competition getting really tough in the big stream it is only natural that some of the more aggressive members of the family would move out into the lesser streams where a good meal could be gobbled up without having to tail-slap a brother or two out of the way to get at it. To such wayfaring smallmouth a foray into the minnow-laden Brokenstraw surely must have been as fulfilling, as rewarding, as if a greedy man took a walk in a pie shop.

However, the coming of the northern pike is a slightly different story. For while the Allegheny can possibly lay claim to furnishing the smallmouth population of the Brokenstraw, the shoe is on the other foot so far as the advent of the "great northern" is concerned. For according to Fish Commission personnel, the northern pike were first stocked in the Brokenstraw, near its headwaters, as somewhat of an experiment by the Corry fish hatchery. From this point, these fish spread themselves over the length of the Brokenstraw and overflowed into the Allegheny. This could easily be a fact, for one of the best eddies on the Allegheny for this species is the deep washout at the point where the Brokenstraw flows into the river.

This junction of the two streams can be located on the map near the point where Routes 6 and 62 meet just west of Warren. A good camping ground, the Buckaloons Camping Area, is located here at the mouth of the Brokenstraw, and no permit is needed to pitch your tent. This location has the advantage of not only being within a few miles of the best fishing on the Brokenstraw, but is in close proximity to some of the finest eddies on the Allegheny, as well.

However, there are those who swear by the stretch of the Brokenstraw that lays between Youngsville and Pittsfield. If you want to give this section of the stream a try, its only three miles upstream from the Buckaloons area. And although you might have some difficulty finding a place to pitch your tent in this vicinity, there are excellent motels and hotels where a room can be had, or you might try one of the tourist homes in this area. Rates at any of

them are modest compared to charges in other sections of the state.

Meals, some really tasty eating, are readily available around these parts," too. In Youngsville you might try such places as Lon's Dinner Bell and the Fairmont Hotel if you're set for heavy eating, or the Circle Bar-B-que if you want to grab a quick sandwich. The Circle is an all-night diner, so it's an ideal place for a cup of "java" or an early morning stack of hot cakes. There are other good eating places, of course, but these carry a personal recommendation. In Pittsfield the Pittsfield Inn is well known for its steaks and chops.

It is at Pittsfield that the Brokenstraw splits itself into two branches. The branch preferred by most fishermen, and the larger of the two, is the one that runs parallel to the highway (27-77) between Pittsfield and Corry.

Ken Corey, the fish warden in this area, states that in his opinion the best trout fishing on the Brokenstraw is between Youngsville and Spring Creek with possibly the best section, at least for whopping trout, being in around Pittsfield. His opinion is supported by several veteran anglers of the stream, with a few still sticking to the section around the Deer Head Inn (further upstream between Garland and Spring Creek) as the one and only place to catch big trout on the Brokenstraw. However, all of them are agreed that a fisherman could hook into a record trout anywhere on the stream from its mouth at Buckaloons to Spring Creek, or even Corry.

They are all agreed, too, that warm water fishing on the Brokenstraw has improved immensely over the past couple of years. Ken says that for bass and walleyes (yes, they have been picked up quite a lot of walleyes in the Brokenstraw last season) he would recommend anywhere in the section between Buckaloons and Spring Creek. But, for northern pike, he would have to give his vote to the part of the stream that is sluggish and has a lot of deep holes which starts just below Spring Creek and runs on pretty well above it. He has a lot of backers on this choice, too. What is more, it is up in this section that northern pike up to 40 inches have been taken consistently over the past few years.

In the vicinity of Spring Creek finding a place to pitch your tent shouldn't be too much of a problem. However, as most of the land in this section of the stream is privately owned, you had better check out each possible camp location. There was a time when none of these landowners objected to the camping fisherman, in fact they were glad to host him, but they have had some bad experiences since then.

There are a few tourist homes in and around Spring Creek, but for other accommodations the fisherman will have to drive to the motels or hotels. But as the complete distance between Pittsfield and Corry is only 18 miles, with Spring Creek just about centered between them, this presents only a minor problem.

From an angler's viewpoint the Brokenstraw is the most "democratic" of streams. That is, while live bait is undoubtedly the most popular lure for both trout and the warm water species, artificials of every type and action have been known to produce excellent catches at various times and places all the way from Buckaloons through to Corry. However, as live bait dealers are not too com-



Fall Run of Lake Erie Rainbow Trout

Evidence of a fall run of rainbow trout from Lake Erie into Pennsylvania tributaries was obtained as a result of recent netting operations carried on in a major Lake Erie tributary.

The above trout, a 26 inch, 6 pound male, was netted at the mouth of Crooked Creek on November 18, 1960, as he was moving upstream from the lake. This fish was unmarked. However, two days earlier, two 17 inch *marked* female rainbows were netted in the same stream. These two marked fish were planted in Crooked Creek on April 27, 1960. The average size of the consignment of trout planted in the stream on that date was 9.5 inches.

It is not known whether the movement of these trout in from the lake during this time was for spawning purposes as none of the fish were in ripe or spawning condition.

The Fish Commission has been planting several Lake Erie tributary streams with yearling rainbow trout every spring in an attempt to determine if these plantings will increase the lake-run rainbow trout spawning populations. The number of marked trout returning to tributaries to spawn appears to be greater when the trout are planted as legal size fish rather than as fingerlings. —*Alfred Larsen, Fishery Biologist, Lake Erie Station, Erie, Pennsylvania.*

mon along the stream, the fisherman would be playing it smart to bring a good supply of his favorite wrigglers with him.

In other respects, too, the Brokenstraw is democratic in its ways. From Buckaloons to Corry one will find some place with just the kind of water he likes to fish. There are wild wooded sections, and stretches that meander through cultivated meadows; swift riffles, and long, deep holes. It is a stream of many moods, many actions, but somewhere along its length there exists a portion of fishing stream that will appeal to, enchant, any one.

It's a stream that welcomes all fishermen. And now that it has come up with some bass, walleye, and northern pike fishing to match its fabulous trout fishing it's a stream you should circle on your fishing map. Further than that, you should make it a point to get there and fish it sometime.—*Don Neal*

Take Your Dad Fishing!

Boys of America. Let's all take Dad fishing! If you don't, you're missing a golden opportunity to reap a harvest of outdoor fun and all the fishing tackle you need and want. Besides, it will be good for him to get interested in something besides baseball and bowling.

In practically every outdoor publication you see articles urging fathers to take their sons fishing. These stories cite the look of pure bliss and sparkling excitement that tinges the innocent faces of boys as they land their first four-inch bluegill or six-inch trout. Just think of the look of pure wonder and joy which will appear on Dad's face when he lands *his* first fish.

The stories also cite the character-building benefits to be derived from taking a boy fishing, with much quoting of "as the twig is bent—" and such noble sentiments. Chances are, Pop could stand a little character-building even this late in the game, so you are on very firm ground ethically in your efforts to introduce him to the joys of stream and lake.

Most articles of the type mentioned assume that Dad knows all about fishing and Junior doesn't know one end of a rod from another. Now, you boys know that isn't always true. In lots of cases the "old man" had his closest approach to outdoor sports when he lined up at the general admission ticket window of the nearest ball park. Meanwhile, you have been getting well-acquainted with the finny residents of nearby runs, creeks, rivers and lakes, ever since you were big enough to quietly toddle off from the confines of the family yard. Don't let on about this. Let him think he's got to teach you. Even if your last request for a "spinning outfit" resulted in your getting a drum majorette's baton, or at best a cheap non-multiplying reel, 25 yards of 70-pound-test cotton line and a pole that bends like a bow and stays that way, he's the expert and that's the only terms on which he will play your game.

Now to the campaign. You've got to start early and proceed carefully. Suddenly suggesting that he get up at five o'clock in the morning to take you fishing is likely to result in a heart attack, or at least a case of shivery jitters. Remember, he probably hasn't seen the sun rise since he left the Army at the end of some war or other that you are now studying in history.

Probably, the best time to launch your campaign is in late January or early February. By this time his finances should have recovered somewhat from the strains of Christmas and New Years. The excitement of last year's pennant race and World Series should have worn off. The chances are, by now he will have slipped on the ice and strained some important muscle, so that he can't go bowling. In short, he's bored, so he should be receptive to suggestions about something to do.

Right after dinner, when he's in a good mood, plant your first seed. Remark casually "Dad, why don't we go fishing together some time? Danny Smith's father takes him fishing." Let this thought germinate a day or so. You've got lots of time because trout season won't open for at least two months. Smoothly and gently, boy, that's the ticket.

Every Dad, no matter how distant or busy he may seem, wants to be a real pal to his son. So, now you've got to

While You're Waiting for Spring

GET IN THE WORKSHOP ►

MAKE A FISH SCALER

appeal to this soft spot in his defenses. Let go your second round. "Danny's father is a real pal to him. They go fishing together all the time." This should strike a responsive note, but the time is not yet ripe for final victory. He'll need time to make up his mind that from now on he's going to be a real pal to his son.

Next, you've got to appeal to your Dad's pride. This should be the clincher. Simply say "You know, Dad, Danny Smith's father is a real good fisherman. But, I'll bet you could be a lot better than he is, because you're smarter." Let's see him wiggle out of that one!

Now comes the time for direct action. Maneuver him in the direction of a sporting goods store at the very first opportunity. Point out the swell rods and reels in the window. Tell him "I guess you'll need a rod and reel for when you take me fishing, won't you?" Try to get him inside. If you can get a rod into his hand, he'll probably come out owning both a rod and reel. The only thing he can do with it is go fishing, so now you can get down to the specific question "When are we going fishing, huh, Dad?"

Of course, once the big day has been decided on it will be a simple matter to see to it that you both are properly equipped. He's got a rod and reel, and that's about all. Now say "What kind of hip boots are you going to get, Dad?" This probably never occurred to him before, but having decided to go fishing he is now an expert, so naturally you and he will have to go back to the sporting goods store to get the things he—and incidentally you—needs. You'll probably get second best but don't worry. With proper application to duty, you'll soon own all the tackle and equipment he has brought for himself.

Here's how you do it. After the first couple of fishing trips your second-rate tackle should be showing extreme signs of wear, if you have been properly hard on it. Since yours won't work any more, you'll have to say "Can I use your rod and reel when we go fishing the next time? Mine doesn't work any more." Now, your father just isn't about to buy new tackle when he has already decided that his new-found skills demand that he get a new and better outfit. So you'll get his, and everybody's happy with the possible exception of Mom, who's been saving up for a clothes dryer.

This isn't the end of your opportunity. Set your sights on bigger game. Specifically, that new rod and reel, tackle box, creel and fly box he just recently bought. To do this you must arrange to go fishing by yourself on several occasions when your Pop has to work. Then you "borrow" his equipment. After you have been able to get away with this a few times, you should have acquired a "quit-claim" title to it, and it soon will be regarded as yours. By the time he catches on, it should be somewhat worse for wear and he will have an excuse to buy that special hand-made tackle he's had his eye on. There's practically no limit to how far you can go doing this.

Will this plan work? Why not? It's working all the time in thousands of homes all over our State. Boys of America Unite! Take Your Dad Fishing—*Ernie Brown*



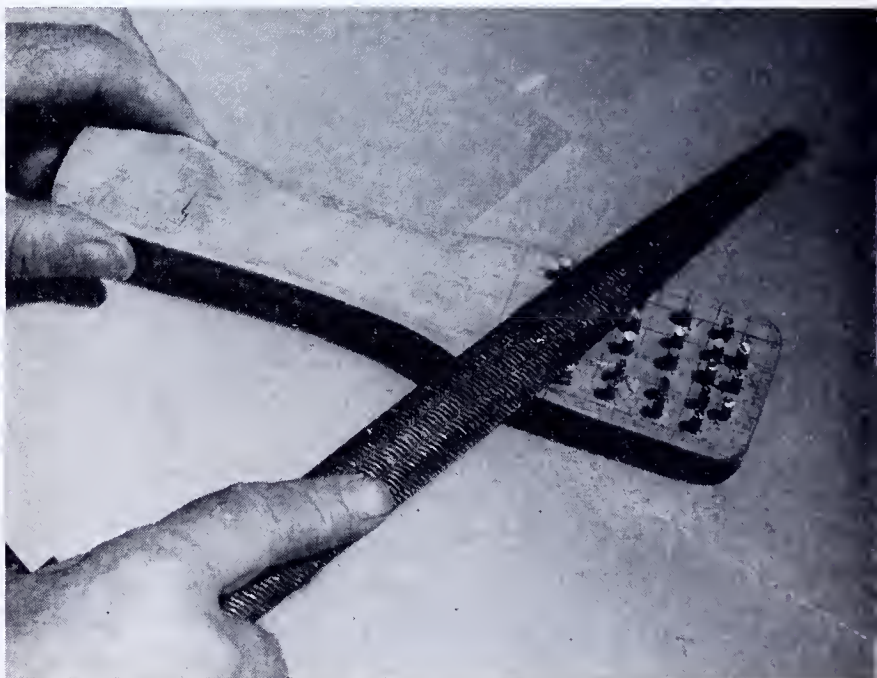
SAW the handle from 1/2-inch thick pine. Finished cut-out should be approximately 8-inches long, 2-inches wide.



DRILL six rows of five holes each for ten-penny nails.



DRIVE the nails into the holes in the pine handle. Aluminum nails are best to prevent rusting.



GRIND, then file the nails until they stand only 1/4 inch above wood.

FASTEN a piece of aluminum sheet metal to back side of scraper to prevent nails from backing out of handle.



FISH SCALER will knock the scales right off a rhinoceros! Easy to make for the home hobbyist, it's also fine for combing and removing burrs from your dog's fur.





EAST SANDY creek emerges from deep gorge before its rendezvous with the Allegheny south of Franklin.



In Venango County

East Sandy Is Dandy

Imagine a trout stream within easy driving distance of nearly two-million people where you can enjoy an evening of fly casting amidst pine and laurel-covered hills—and actually be lonesome for company!

Such a stream is East Sandy Creek in Venango County. It's within a two hours' drive of Pittsburgh and dozens of other western Pennsylvania communities. Swift and rocky with many lovely pools, this creek offers about 12 miles of fishable water. It is open to public fishing all the way. It is heavily stocked with brown trout, and also has a seasonal carry-over of trout. Yet it is never over-fished.

If this sounds like a chapter from Grimm's Fairy Tales, let me explain one feature about East Sandy. It is not closely paralleled by roads at any point. Roads either cross or run down to the creek at five places. But only two of those roads—Route 257 between Rockland and Cranberry, and Route 322 at Van—are major highways. The others are country dirt roads and best located by using a bird-dog, a radar set, and a horseshoe—preferably all three in combination.

Lest I touch off a stampede let it be further added that East Sandy is perhaps something less than a classic trout stream. It is affected by oil seepage, and also evidently gets a bit of acid drainage. Its streambed rocks are frequently coated with sulphur-like slime. At least one of its tributaries is cold, gin-clear, lovely to behold—and practically sterile.

Nymph life in the mainstream is neither varied nor abundant. Therefore, fly hatches are usually sparse and uncertain. Minnows and food-fish are surprisingly scarce for an Allegheny feeder stream. As a matter of fact the stream's predominate aquatic life is brown trout; and unless they eat one another I am not prepared to say exactly what they do eat, for this creek simply must not have much natural forage.

Nevertheless, East Sandy is a dandy trout stream. The trout seem to have adapted themselves to life in a comparatively low protein environment. This is a creek you will come upon and find not a trout rising or a natural insect on the water. But, having made the trip, you decide to get in a bit of casting. So you tie on a dry or wet fly, whip out a few casts, and—splursh!—you are into trout.

The most remarkable feature of all is the midge hatch which occurs practically every mild evening from early May through June. Promptly at dusk the trout begin surface feeding on infinitesimally tiny midge flies, and it is not uncommon to find a dozen or more brownies rising furiously in a 15-yard stretch of water.

To take trout under these conditions it is necessary to cast a #22 black midge on a 6X leader. If you have a delicate touch and can master the technique you can take trout after trout after trout. This evening midge hatch fishing offers the finest sport the stream affords.

My favorite stretch of East Sandy is the lower four-mile section from Route 257 to the mouth where it empties into the Allegheny River. In normal flow the creek varies from 20 to 40 feet wide at this point. It is paralleled by railroad tracks of the New York Central line. The railroad tracks follow the ridges with the stream tumbling far below through a deep-cut gorge.

A short distance below the Route 257 bridge the creek enters into a series of wild ramblings and at one point nearly doubles back on itself in a sweeping U-turn. The stream here is swift, rocky, tumbling water with many lovely, rock-bound pools and forested slopes rising 300-feet above the banks.

In its headwaters East Sandy flows down through wild country before crossing under Route 322 at Van. It rises



FAST WATER and riffles in the lower East Sandy.

from an elevation of 1,545 feet and empties into the Allegheny at 1,000 feet five miles downriver from Franklin.

Two miles above Van the mainstream forks into East Sandy and Little East Sandy. These are both small streams and may be reached only by foot. If the stream contains any trophy-sized brown trout, upper East Sandy above the forks would be the place to fish for them.

Considering its proximity to densely populated metropolitan areas, East Sandy Creek is an excellent bet for the western Pennsylvania angler to get in a bit of troutng. The surrounding countryside is wild and scenic; and excusing a bit of slime on the rocks the creek itself is nice to see and nice to fish.

Frequent visits over a period of years have convinced me East Sandy is as productive a close-to-home stream as can be found anywhere in western Pennsylvania.

—Jim Hayes



Tying the Leader

We start early to replenish supply of leaders and tippets. Come opening day of trout season there is the usual rush tying a few more “killers” and checking the numerous items of equipment so essential to modern trouters.

Leader nylon materials in diameters .021 — .019 — .017 — .015 — .013 — .011 — .010 — .009 — .008 (3X) — .007 (4X) — .006 (5X) — .005 (6X), etc. are stored in cup-size, screw-top jars. All the diameters are checked for short supply, especially tippets which are used in greater quantity than other diameters. Its very disconcerting to wade into the stream on opening day and find only old tag-end tippet left-overs from last season.

To tie body of the leader turn jars bottom-up in diameters .021 to .009 inclusive. Pull out 12” section of .021, hold end in mouth, with index finger pressing material to edge of jar clip off a 12” section. Place jar on table top-up. Tie end-loop in butt section and attach hackle pliers to the end-loop. Take .019 jar and clip 12” section. Place jar on table top-up. Tie sections with barrel or blood knot. Do not clip waste ends of knots (see below). Continue to tie sections, including .009 which completes body of leader. The body leader will be about 7½’, depending on tying waste. Tippets are added to body leader as needed on the stream. Coil body leader and tie coil with short piece of string.

After supply of leaders are tied steam the knots over boiling teakettle. Hold knot in steam and pull (do not jerk) until knot sets securely. After knots are set on all the leaders clip waste ends from knots. Coil the leaders and place them in small coin envelope.

Tippet diameters .008 (3X), etc. in 20” sections are carried in small coin envelopes appropriately labeled for use on the stream. To set the barrel knot when tying tippet to leader hold knot in mouth a few seconds and pull tightly (do not jerk). Never bite nylon, use finger nail clippers as they cost less than dental service.

Our leader butt must not be less than .021 diameter in order to continue reduction of line taper. For example; diameter of D line is .045, first section of taper is .040 (E) or reduction of 11%, second section of taper is .035 (F)



Jonah's Whale

Currents continuously chew banks and shorelines into odd shapes and formations. No shoreline is permanent, for it is reshaped, moulded and changed continually, so that no stream remains the same stream year after year.

Fishing Creek near Orangeville and Benton, Columbia County, is a renown trout stream. Farther downstream, near Bloomsburg, where the creek pours into the North Branch Susquehanna River, the stream becomes a sanctuary for smallmouth bass. It was during an outing for bass that I crossed a railroad bridge one morning in that region. As I paused for a peek at the creek below, I was greeted with a scene that instantly reminded me of the Biblical account of *Jonah and the Whale*.

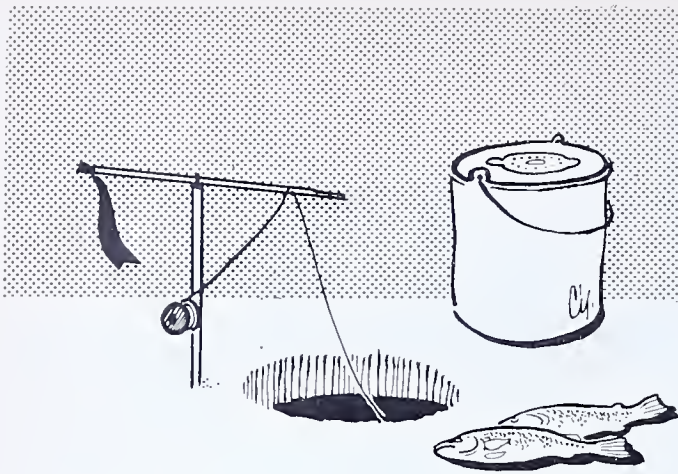
A fisherman, handling a spin rod superbly, stood on the rim of the deep pool. But it was the outline of the pebbly shoreline that amused me and brought the Biblical picture to mind. The shoreline was drawn to an exact likeness of a fish's head. The angler stood inside the gaping jaws, as though the pebbly fish was prepared to swallow him!

For the moment, the shoreline of this stream seemed to recreate the Biblical story when the angler stepped into the pebbly scene.—Don Shiner

or reduction of 13%, third section of taper is .030 (G) or reduction of 14%, fourth section of taper is .025 (H) or reduction of 17%. The butt leader section .021 is reduction of 16%. Our leaders are continuation of the line as percentage reduction of leader sections do not exceed reductions in line taper. We use long-fine leaders and they cast perfectly, even on short casts.

Knots are needed in our leaders. Dropper tippets can be tied with improved jam knot just above leader knot. Also Mr. Trout sometimes signals for Midge lure by striking or bumping barrel knot on the leader.

When Black Stone or Light Cahill bite a wary trout its a grand feeling; that is, until we are inspecting leader for next cast—suppose it was this long-fine leader that really fooled him?—Art Clark



RETURN OF THE FLY ROD

The way spinning has been played up in the last few years as the one and only way to fish for trout has made some people wonder if fly fishing is on the way out. The answer is a big emphatic NO. On the contrary. If you ask any of the big, complete sporting-goods stores they'll probably tell you the same thing that Murta-Appleton in Philadelphia and William Mills & Sons in New York report. They say that there is an increasing demand for fly-fishing tackle, particularly from spinning-rod addicts.

The reason apparently is that spinning has been oversold and overtouted so much that only now are fishermen realizing that it has some disadvantages and isn't necessarily always the best way to catch trout. A lot of people have forgotten, or never knew, that stream insects, in their various life-forms, provide by far the biggest portion of the trout's diet during most of its life. The figure varies from stream to stream according to how much insect food is available, but the percentage is always large until the trout gets big enough to become a cannibal. Why trout prefer insects to any other food we may never learn until someone teaches a trout to answer questions, but they do. Even in a hungry stream you can find trout hanging around the edges waiting for grasshoppers, ants and other land insects to fall overboard.

Some streams are kinder to the spinner fisherman than others. If you really want to hear a spinner talking to himself in angry tones, find one who is using metal lures on a rich limestone stream like Penn's, Fishing, Spring or Bald Eagle Creek. There insect food is so plentiful that it is close to a hundred percent of the trout's nourishment until he gets to be a big cannibal. In fact, there is so much rich insect food right on or near the bottom the fish won't bother to rise and feed on the surface unless there is an unusually heavy fall of big, tasty flies. A well-sunk wet fly will beat any other artificial lure hands down in such a stream, most of the time.

Contrary to what one can read, spinning has some disadvantages. One is the cost of getting hung up. Those sinking lures with their small sharp trebles are easy to snag, and unless the caster can wade out and retrieve his lure it is going to cost him a dollar or more every time his lure hangs up. It is remarkable how often a fly fisherman wading a stream at low water finds snagged spinning lures that were lost when the stream was high and hard to wade.

The plop and surface disturbance a spinning lure makes

even when expertly cast is no help when fish are scary and the water smooth and quiet. Fish can be scared by casting a fly too, but a fly fisherman who uses fine leaders and knows how to lay 'em down can take trout that a spinner would panic.

Another advantage of fly fishing is the number of lures that can be carried in small space. A big wet fly book and a big dry fly box will hold imitations of more different trout foods than a suitcase full of hardware. Best of all, the skillful fly fisherman can carry a pocket kit with which he can quickly make a pretty darn good imitation of what the fish are taking, right there by the stream. That stunt has sent home many a smart angler with a heavy basket.

Arguing whether spinning or fly fishing is the more fun is like arguing religion; it gets nobody anywhere. But if those who have never done it would give fly fishing a fair trial, most of them would find that they had discovered another way to have fun with their fishing.

—Sparse Grey Hackle

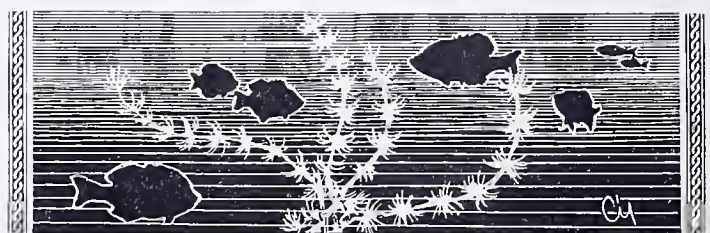


Omelets – Snapper Style

Female snapping turtles used to come out of the swamp each year and climb to the highest ledge they could find on a dredge cut that ran into Slow Crick. The slow moving snappers would lay their eggs and bury them in a peculiar way. We would watch them dig a hole, using the hind legs, and almost fill the excavation with many leathery, soft-shelled eggs. These were smaller than hen's eggs, and of course lacked the limy shell. They would close up the hole, and in a manner that seemed more artful than instinctive, arrange the site so that nothing would seem to have been disturbed. Usually their camouflage was in vain because skunks or raccoons would find the caches, dig up the eggs, and devour them on the spot. Mother would make up a fine batch of omelets if we found a nest of fresh turtle eggs. If we hadn't seen the turtle lay them, however, she turned a deaf ear on omelets.

Speaking of eating eggs other than those of domesticated fowl reminds me of a custom common in my boyhood days. There were islands in the lake that were uninhabited by man but completely possessed by the gulls. So close were the nests . . . if the few sticks and weeds assembled could be dignified by that term . . . that one could hardly walk without breaking eggs or, later in the season, trampling the young.

Hotels in the vicinity would send out egg collectors to the islands daily to gather gull eggs by the boat load. A pair of gulls would normally lay two eggs, but if you remove the eggs daily, they will continue to lay two weeks or longer. Many a cake and omelet was island bred, and the subterfuge was unsuspected by the most discriminating guest.—Carsten Ahrens





MINNOWS TEMPT BIG BROWNS

On a big stream, lake or river I like and use the spinning rod to fish minnows. However, on small streams it's the fly rod. You will want a bass action fly rod with plenty of backbone, an automatic reel, a medium-priced level D line, and you had better tie up a lot of leaders. Ten pound test isn't a bit to heavy.

I tie them using a seven foot piece of leader material, tie a small swivel at each end, then, using a three foot piece, tie a small safety-snap swivel on one end. Now hook the safety-snap to the swivel on one end of the seven foot piece and tie your line to the one on the other end and you have a ten foot leader, plenty long to fish one of these small streams with minnow. Now we need some minnows or chubs two to four inches long, and some No. 2 and 4 treble hooks. Now if you think this is crazy tackle for trout, please remember you're not fishing dry-fly in open water and won't be catching eight or nine inch trout. A 6x tapered leader that tests one and three-quarter pounds is fine for what it's intended but it isn't good here.

When one of these "fight-till-death" stream-seasoned browns comes flashing out from under a log-jam, overhanging bank, tree roots or wherever he's hiding and socks your minnow you've got to hit him hard, quick and hold him to keep him from getting under something where he can foul your line. You'll be glad for big hooks and heavy leader now or you'd stand to lose a good fish.

Kill a minnow by breaking its neck (best done by pulling its head up and back). Then run your leader through it lengthwise, in the mouth and out the rear. For a 2½ inch minnow, tie on a No. 4 treble hook and pull it back up inside the minnow. You are now ready to fish the crippled minnow. If you want it to spin, hook one of the hook points back of the anal fin. Now suppose you are going to fish a "hot-spot." Always fish from the side of the bank under which you think the trout is hiding. Remember he's smart, and would see you quick if you tried to fish it from the open side. If you must cross a stream to get in position to fish a pool, keep well-back from the water and go down stream at least fifty feet before crossing. Never, never, cross the stream close to a pool you are going to fish.

Keep out of the water as much as you can. Walk slow and easy, (a heavy step may be all he needs to put him on his guard). Keep well back and get in position at the head of the pool. Drop your minnow into the fast water and let it float downstream about two feet. Then give five or six short jerks bring it back up stream about twenty inches. This will cause it to look like an injured minnow that's trying to keep from being washed down stream. Repeat this procedure letting the minnow float a foot or sixteen inches farther down stream each time. Keep this up until you get a strike or have fished through the pool. Don't lift your minnow out of the water! A big brown may be watching it and he knows it's hardly natural for a minnow to fly.

Fish the pool through five or six times before giving it up. Should you get fast on roots or other objects don't wade in or make any commotion in the water trying to get



FAVORITE SPOT . . . you can see where spring boils out . . . big browns set up store right here.



HOT SPOT is under bridge under roots . . . just a small crick but Ach, vat Browns!

it loose. Cut your line close to the leader and tie it fast to something.

I always carry in my creel a few small pegs, made like tent pegs, about three inches long. When my hook gets fast I tie my line fast to one of these pegs and push it down in the bank and go on fishing. I leave my leader there to be picked up after I have caught a nice trout or decided there were none there. I have had as many as four leaders staked out at the same pool many times. If you see chubs chasing after your minnow you can be almost sure there is no big trout in that pool. Always fish your minnow down stream and slowly. It is bleeding and giving off odor. Give this odor a chance to get to the trout before your minnow docs. It will make him hungry. The brown trout is finicky at times, but he's also greedy and a lazy cuss that seldom turns down an easy snack, especially if it's his favorite food, a crippled minnow so easy to catch. And like a growing boy, it takes a lot to fill a big brown.

Mr. Brown will usually be hiding back under the breast of a dam, watching for any easy tid-bit that may be washed over the dam. This is the place to use a live chub. Use a big one, 3 or 4 inches is about right. Hook it up through both lips with a No. 4 short shank hook. Strip out a handful of line and hold it coiled loosely in your left hand ready to let loose the instant you feel a trout take your chub. Now put it in the water and let it wash over

the dam, and let it swim around in a restricted area for a few seconds. Then bring it up fast two-thirds of the way to the top of the dam, and let it drop back with a splash. Try and make it look like a chub that had been washed over the dam and was trying to get back up. Do this several times. If there is a big brown there he won't be able to resist it very long. He'll be afraid the chub might get away from him. When he grabs your chub be sure to let your handful of line loose, and let everything slack for at least half a minute. A minute would be better if your nerves can stand it, then slowly tighten up on your line, and soon as you feel him hit hard. He'll come boiling out fighting mad, perhaps see you and head back to his hiding place. If lucky you can coax him out to open water. If not, wade in and chase him out. Don't try to net him till he's licked, and he'll take some licking. You'll have to be rough on him at times because of the small size of the pools. You will have to stop his runs real quick to keep him away from some place he can foul your line. This is another time you'll be glad for big hooks and strong leaders.

One other thing, I always get my minnows and chubs from the stream I am going to fish. My landing-net is quarter-inch mesh and I am never without fresh bait. I catch five or six at a time and carry them in a wide top, refrigerator jar sealed tight.

Maybe you think this is the hard way to catch trout and maybe it is, but big trout don't come easy, especially those red-fleshed small stream-seasoned browns.

—R. N. Hamilton

Selecting Spinning Lures

Gamefish take artificial lures mainly because they are hungry, but also because they may be curious or playful, or because the lure makes them angry enough for them to strike at it to get it out of the way. We all know of lures which look and act very little or not at all like anything fish might want to eat. We wonder why fish bother to strike at them at all. These lures may, at certain times, make gamefish angry or playful, or may excite enough curiosity to tempt strikes. But the most important reason for fish taking lures is because they are hungry. Thus, the more a lure looks and acts like a bait-fish, the more effective it should be.

In selecting the right lure to use under existing conditions, there are five very important characteristics to consider. These are *form*, *flash*, *action*, *color* and *size*.

The "form," or shape, of the selected lure depends largely upon what we think the gamefish are feeding on. Form is very important in salt water angling but, in the opinion of many who fish in fresh water, it is one of the least important of these five characteristics. If fish are feeding on little eels or salamanders, for example, a long, thin lure should be better than a short, wide one. This also holds true when the prevalent bait-fish are long and thin—like a little pickerel, for instance. Usually, however, the ordinary fish-shape comes nearer to what we want. This can be simulated by a wobbler, a plug, a spinner, or something else. The other four characteristics will help us decide which it should be.

"Flash" is very important, and narrows down our selec-

tion of lures considerably. When the sun is bright, and especially when waters are low and clear, we already have noted that too much flash may frighten more fish than it attracts. Such conditions do not recommend a brightly polished lure. On the other hand, when the day is dark, or when waters are swollen or discolored, a brighter lure should be better than a duller one. Fish can't see very far when waters are discolored, but they will see a brighter lure more easily, and from a greater distance.

"Action" is very important, too. Notice how bait-fish swim, especially when they want to get away from something which frightens them. Try to select a lure to which you can give a very similar action. We have noted that a spinner primarily is a near-surface lure, and that it may not work well when fished too deep. A spinner also should be fished at a fairly even and moderate speed. Wobblers are to be preferred to spinners for deep fishing or for erratic retrieves. A wobbler which can be bent and rebent to adapt its action to fishing methods has special advantages. The faster one fishes it (or trolls with it), the straighter it should be. When using it in quiet water, or as a jig, it should be bent into a fairly pronounced curve. Thus, such a wobbler can be made to do the work of several lures.

Of the five characteristics being mentioned, form and color seem least important. The color of the lure *in the water* should be as near as possible to that of the bait-fish we are trying to imitate. It is the general effect which counts, since elaborate detail is hard to distinguish when a lure is in motion. Fancy decoration is attractive, and certainly does no harm. Undoubtedly, fancy decoration appeals more to the fisherman than to the fish. In seeking the proper general effect, note that bait-fish scurrying through the water predominantly appear to be mostly of one color, such as black-green, green-yellow, or grey. It seems sensible to try to match this. Remember, though, that it is the color of the lure *in the water* that counts—not the color in the tackle box. For example, a predominantly white lure may look yellow or tan in discolored water, while a yellow one may appear to be orange or brown.

This color imitation theory sometimes has exceptions. Fish which strike from anger, curiosity or playfulness may strike more frequently at very unfishlike color schemes, especially when they want nothing else to invade an area which they consider to be entirely their own. Thus, we might advise that the imitation theory be tried first. If it doesn't work, try something just the opposite. If it doesn't work, my belief is that the type of lure should be changed regardless of the color.

"Size," along with flash and action, is very important too. Small lures often catch more fish than bigger ones. This is especially true of the various species of trouts and of the panfish. It is less true of bass, pickerel and pike. If gamefish seem to be feeding on a certain size of bait-fish, a lure of this approximate size should do the trick. If we must decide between two lures sizes, the safest bet usually is to select the smaller one.—Joseph D. Bates, Jr.

•

In fishing, kids don't want to be told . . . they want to be shown. It takes years of telling to undo one unwise showing!



—“And now, I’ll have more time to wet a line!”

Retired . . .

**after 43 years as Administrative Secretary,
Pennsylvania Fish Commission**

H. R. Stackhouse (Mr. Fish Commission) has retired. After 43 years continuous service to the Pennsylvania Fish Commission, he has now left a post he took in 1923, since holding the position under every Executive Director of the Commission except one. At the beginning of 1960 he was appointed Acting Executive Director and was urged by friends to accept the front office post but declined. In 1954 he was honored by the Pennsylvania Fish and Game Associations’ Gold Medal Award as the outstanding sportsman of the state. Those who have met and known him have become richer for no one could escape the world of warmth, charm and dignity with which this fine gentleman was abundantly blessed. The entire commission and all his friends everywhere bid him this reluctant but fond farewell.

Fishing Season Coming Up!

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You're The Cook

All fish cookery is a fine art. Few anglers cook fish right. The amateur has much to learn. The experienced can always improve. The expert is rare indeed.

One of the greatest culinary achievements is that of cooking fish with a minimum of equipment where cooking fire or beds of coals are substituted for the refinements of the home kitchen.

Iron frying-pans, grills, kettles, and pots have seldom ever been excelled for making the angler-cook highly satisfied with his culinary attempts.

Here are some standard methods of camp fish-cookery which may be easily learned by novice out-of-door cooks.

Fish in the Frying Pan

Perhaps the simplest and most foolproof method of cooking fish is an iron frying-pan. Heat the pan very hot, using plenty of pork or bacon fat. Fry small fish whole. Large fish should be split or cut in slices. Roll the fish in corn meal, well-seasoned with salt and pepper. Fry it to a golden brown. Cut backbones of small fish to keep them from curling in the pan. In the case of large fish, free the ribs from the backbone so that the fish will also lie flat in the pan.

Fish on Broiling Sticks

Skewer small fish on long sharpened green hardwood sticks. Place thin half-slices of salt pork or bacon between each fish. Turn the stick constantly so that the flesh will not burn and the juices will be retained.

Larger fish may be cleaned, slit up the belly, and lined with a thin slice of pork laid lengthwise. Push the forked tines of the stick through the fish and pork in the region of the backbone, and broil over the coals. Season as desired with salt, pepper, and paprika.

Aluminum Foil

Clean the fish. Wrap each fish securely in the aluminum foil, and place the packages on the hardwood coals. Test the tenderness with a fork. The time of cooking depends upon the size of the fish.

Reflector Oven

Use oven made from large lard pail with metal shelf improvised inside, or a large rectangular biscuit tin. Place oven in front of a clear cooking fire. A hardwood fire gives a much more consistent heat for baking than a flashy softwood blaze.

Clean the fish, remove head and tail, grease surface of fish with cooking oil or melted butter. Place fish in a greased iron pan. Bake slowly in front of the fire, keeping the baking pan far enough away from the heat so that the drippings will not evaporate and result in the flesh becoming overcooked and dry.

Season the cooked fish with salt and pepper just before serving it very hot on tin or aluminum camping plates.

Boiled Fish

Place fish in boiling salted water to which 2 tablespoons of vinegar or tomato juice have been added to keep the flesh firm. Allow for cooking 6-8 minutes to the pound.

—J. Almus Russell

Field Notes

Real Gone Gull . . .

John Hogelman of Wheatland, and his son-in-law, Michael Ellenberger of West Middlesex, Pa. fished Pymatuning Lake recently when they observed a gull struggling to take off from the water. It could go a short piece but not very high. Believing the bird to be crippled the two anglers investigated. After a chase they captured the bird. It was well hooked with a musky-size "Pikie" plug it probably mistook for a big minnow. The two fishermen unhooked it and the grateful gull sailed away, wiser, not to be as easily gulled again!

—Warden Raymond L. Hoover, Crawford County

Catfish Carries Switchblade . . .

It's illegal but a catfish in Black Moshannon Lake, Centre County was found with a knife attached to an old hook and leader after it was yanked in by an angler, rightly amazed. This story, of course, builds up to the point where it's been this blasted catty all the time that's been cuttin' all the lines on the ones that get away. . . .

—Warden Paul Antolsky, Centre County

Turtle's Obituary Greatly Exaggerated . . .

There was this turtle known to be "daid and burried" up in Shawnee Lake. This turtle was caught in 1958 and at a garage, had the date "1958" carved into its shell. In September, water was drawn from Shawnee Lake exposing the bottom. This was a good chance for the turtle hunting boys who swarmed all over the place gathering in 30 of the critters . . . in the mess, sure enough, was this old, beat-up turtle of 38 pounds, still snapping and still bearing the 1958 brand!

—Warden William E. McInay, Bedford County

Vigilantes or the Tender Trap

In an effort to determine species of fish present in Lake Nuangola, Biologist Joe Carol and I set trap and gill nets as a preliminary step to the complete survey. The setting of Commission nets is an operation which arouses the curiosity of passersby. Having exhausted our supply of "STATE NET" signs on the gill nets, we set two unmarked trap nets, hoping for the best. Returning home later that evening I was informed by my wife the Burgess of Nuangola had called, said he had confiscated a net that someone set and was holding it for me! Returning to the lake the following day, we found the second trap net had been removed from the water and piled on shore by other vigilantes, identity unknown, who wanted none of this "pilfering" of their fish. No need to say, in view of these events, I feel quite confident "outlawing" at Lake Nuangola is subject to a thousand eyes!

—Jim Yoder, Warden, Luzerne and Sullivan Counties

Wardens instruct Scouts

Fish Commission Warden Richard Owens and Supervisor Harold Corbin recently presented a program to the Juniata Council (Huntingdon, Mifflin, Juniata and Centre counties) Boy Scouts of America at their Seven Mountains annual camp Jamboree. Using photos and drawings of fishes for identification purposes, discussions on spawning habits, food, etc., the scouts interested in the Angling merit badge as well as others greeted the Fish Commission personnel and thanked them for their efforts.

By the Great Horned Owl . . .

Charles Frank of Honesdale was doing some evening fishing making a cast to shore with a surface lure. Before the lure could smack the water a Great Horned Owl swooped down, took plug, line and all up into a nearby tree. Nobody could translate what the owl said later.

—Harland Reynolds, Warden, Wayne County





Pennsylvania Angler



Spring

March

1961

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GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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Multiple use for food, fibre, fuel,—and fun



■ It would be unusual if a fine home were used just for one purpose, such as the preparation of meals, and its sleeping, bathing or other living facilities were ignored. It would be even more odd to refuse to use all of the facilities of such a home as the family grew with the addition of children. Full use is **MULTIPLE USE**.

Lands and waters of the United States, in a somewhat similar manner, comprise the collective house for the nation's citizens. These are the available resources upon which people, more and more of them each year, must depend for food, fibre, fuel and recreation—the basic physical requirements of life. And, as a home must be cleaned, painted and otherwise kept in good repair, resources must be properly managed and wisely used in many ways. This is **MULTIPLE-USE CONSERVATION**.

Resources generally are grouped into two classes: renewable and nonrenewable. Renewable resources include all living things, both plant and animal, capable of regeneration to provide the food, fibre, fuel and enjoyment of man. Non-renewable resources are the rocks and mineral deposits that provide many of the fuels and

metals which, when used, to all practical purposes, are lost to man forever. **CONSERVATION, OR WISE USE**, is essential for both classes of resources.

Soil and water form the basis, the natural resources, for the well-being of every civilization which has existed on the face of the earth. Productive soil, properly nurtured with water and blessed with sunlight, sustains life. There is a saying that all flesh is grass—epitomizing the fact that great quantities of meat for the table of Americans, as well as wildlife, can be raised on the soil.

There is an intricate interrelationship between such renewable natural resources as water, productive topsoil, forests, grasses, wildlife and man himself. In harmony, all of these resources can be managed for great and lasting benefits expressed in nature's surpluses or bounties. Abused, the evils of soil erosion, floods and low rates of production visit the land to contribute to man's loss in wood, food and wildlife. Renewable natural resources, then, must be managed for **OPTIMUM MULTIPLE USE** or the best use for which particular areas are suited. To assure such a program, a vital necessity as an expanding

The following article is from National Wildlife Federation in recognition of
NATIONAL WILDLIFE WEEK . . . March 19-25, 1961.

human population makes added demands upon resources, will require **BALANCED CONSERVATION PLANNING FOR THE FUTURE**.

Certain portions of man's domain must be preserved in its natural state. The process of evolution must be allowed to take place without interference. **WILDERNESS AREAS** will provide solitude and enhance man's appreciation of life. They may also hold the key to an understanding of the relationship between man and his environment.

The Watershed and People

A watershed is described as a specific area of land which produces water, wildlife, timber, grazing and outdoor recreation, including appreciation for nature. A watershed, big or small, is the area of land drained by a single stream includes the watersheds of its many tributaries. All parts of the nation are in some watershed.

Balanced conservation planning is needed for all uses of the land if the products are to be produced consistently and continually for the benefit of man. This practice of "sustained-yield" may be applicable to all or parts of one or several watersheds.

A watershed embraces all or several of the multiple uses of land and water. It can produce great quantities of water designed for use in homes, industries and agriculture, as well as the esthetic values which come when viewing a beautiful lake or a crystal-clear fishing stream. A maximum of quality water cannot be produced, however, unless there is proper management of the land.

The watershed, in a natural succession of plants, would be protected by trees or grasses except in the higher elevations where climatic limitations exist. These plants, when properly managed, can provide man with a continuing supply of beneficial products.

National Parks and Wilderness areas are a part of the balanced conservation plan. These inviolate, or near inviolate, segments of a watershed contribute to the ascetic and scientific knowledge of man. Maintaining these areas in their natural state assures the retention of water, soil,

forests, grasses and wildlife that otherwise might be lost forever.

Wildlife Conservation

Forests also provide important habitat for fish and wildlife. Trout so highly prized by fishermen require clear and cold water such as that which flows from the depths of forests. Deer and elk, bear, squirrels, grouse, turkeys and a host of other species of wildlife make their homes in or near forests. Cleared tracts within sustained-yield forest areas often support more wildlife than an unbroken canopy of trees because small food-and-cover vegetation is permitted to grow.

Even an unharvested timber and ungrazed area has multiple uses. Many of the nation's finest parks, wildernesses and recreational areas are located within forests which **BALANCED MULTIPLE-USE PLANNING** indicates should be left in their natural state.

Water in its Watershed

Water has been described as the lifeblood of soil, with streams serving as arteries. All living things, including man, are dependent upon water. It is an indispensable resource in the over-all watershed picture.

The **MULTIPLE-USE** policy also is applicable to water resources. Water is valuable for domestic purposes (drinking, cooking, washing, etc.), industries, agriculture and recreation, including habitat for fish and wildlife. Described as "liquid gold" in arid regions, water is useful by its mere existence. Natural flows of water are harnessed for the generation of electric power. Even relatively stationary water, both fresh and saline, provides important avenues of navigation.

Water, like the soil it nurtures and makes productive must be protected. Sometimes in the form of snow or ice as well as rain, water should be held where it falls as long as possible through vegetative cover of soil in the watershed. Water so held does not rush into torrents which flood the valleys. Water so held seeps out gradually to provide sustained flows during times of little or no precipitation. Controlled water is a blessing; uncontrolled water can be a curse.



Covered Bridge at Little Gap,
Carbon County.

The Quality of Water

Unfortunately, some uses of water ruin or damage it for other purposes. Surface streams contaminated by domestic or industrial wastes become problems of good health. Polluted waters, unless adequately treated, cannot be used for domestic supplies. Many types of industrial and agricultural purposes afford recreation, including habitat for fish and wildlife. Improper watershed management results in the siltation of streams.

In view of increasing demands for water, its REUSE becomes more and more important in **BALANCED CONSERVATION PLANNING FOR THE FUTURE**. Quality, as well as quantity, becomes important. Water pollution control, presently a national disgrace, is imperative.

It is the obligation of every citizen to insist that water be returned to the stream in the same quality as when taken out! Research and management must be directed toward keeping as many wastes as possible out of the nation's streams! A maximum quantity of quality water, however, cannot be produced unless there is proper management of the land.

Recreation and Watersheds

If watersheds are maintained in good condition, innumerable recreational opportunities become available to an innumerable host of citizens who enjoy the great unspoiled out-of-doors. There are more than 17,000,000 families—in excess of 25,000,000 people—who enjoy hunting and fishing each year. Yet these are only two easily measured phases of outdoor recreations which include swimming, camping, hiking, boating, nature study and picnicking. It is estimated that more than 70,000,000 people enjoy wildlife photography, the simple enjoyment of observing birds and animals in their natural environments.

Enjoyment of this sort can be maintained only through the proper management of renewable resources—if clean water and stabilized soil are available as sound bases for continued production and as the proper environment for domestic animals and wildlife.

IT IS IMPERATIVE THAT RECREATIONS, INCLUDING FISH AND WILDLIFE, BE ADEQUATELY RECOGNIZED AS PUBLIC BENEFITS OF MULTIPLE-USE RESOURCE MANAGEMENT. Recreations are not recognized as beneficial uses of water in some western states.

Native wildlife made it possible to open the nation's frontiers and provided most of the food and clothing for pioneer communities. Furbearers were important factors in the exploration and colonization of vast areas of wilderness. And, wildlife provided the needs of individuals who wrestled great fortunes from the vast mineral wealth of the country and resulted in the basis for a modern mining industry. Unwise use and lack of proper management techniques completely eliminated some wildlife species and resulted in the extirpation of many from their extensive native ranges. So it is with wildlife, as with all other renewable resources, that wise use and proper management must be exercised if a maximum is produced and maintained for the benefit of today's citizens and their posterity. Modern research methods and scientific information collected by trained and competent technicians.



—Johnny Nicklas Photo

Balanced Conservation Planning For the Future

Multiple use of land and water resources is a product of a modern industrial civilization or society. To survive as a civilization it is important that none of the natural resources be despoiled or wasted.

MULTIPLE USE applies to the many different purposes man has found for the land and water resources over which he was given dominion. The application of improved technology and scientific "know-how" has brought the present generation the highest degree of civilization the world has ever known.

The objective of **MULTIPLE USE** is to conserve and wisely use the nation's lands and waters in such manners that the greatest benefits in enjoyable living will result for the greatest numbers of people. The study of ancient history teaches that 19 of 21 civilizations perished from the face of the earth because of an inability to learn an existence cannot be maintained without the conservation of soil and water. To the end that this civilization will not become the 20th to so perish, each citizen should fully inform himself on the needs for conserving renewable natural resources.

This, Then, is the Challenge

It is recorded in the history of this planet that civilization perished because the people were unable to understand the need for proper use of soil, water, forests and wildlife. In the passage of time, man has been able to solve many of the complex natural processes of life. As each new function is understood, it becomes more apparent that all living creatures must conform to natural laws or they will succumb. THIS THEN IS THE CHALLENGE to the people of America. We cannot afford, nor do we dare to wait any longer but must demand NOW that aggressive long-range balanced planning for multiple use of all natural resources be developed. The future destiny of America is a responsibility that each and every citizen MUST assume.

Fly Fishing Only . . .

By **ALBERT S. HAZZARD**
Assistant Executive Director
Pennsylvania Fish Commission

. . . this article by Dr. Hazzard appeared in POW-WOW, a publication of the Pennsylvania Outdoor Writers Association



■ For the season of 1960, the Pennsylvania Fish Commission designated sections of 28 streams in 22 counties as "fly fishing only waters." The total mileage involved is 92 or about 2% of the 4,300 miles of stream stocked with trout by the Commission.

Fishing on these streams is restricted to the use of artificial flies, streamers and nymphs using conventional fly fishing tackle. Hours of fishing are 5 a.m. to 9 p.m. E.S.T. There is a nine inch size limit and a six daily creel limit. The possession on these streams of natural bait or illegal lures, fish under the 9" size limit or more than six fish, is illegal.

Fly fishing only waters are considered by some as discriminatory and otherwise unfair to the anglers of the state who do not choose to use artificial flies. The purpose of these areas is not to discriminate against any class of fishermen but to demonstrate the value of such restrictions in protecting the wild trout population and in making

hatchery plantings last longer and serve a greater recreational purpose.

The regulations are imposed not because the use of artificial flies is more sporting or because it requires greater skill than bait fishing. Many bait fishermen are equally good sportsmen and fully as much or more skill is required in taking trout on bait than on flies. The only reason natural bait is outlawed on these special areas is that it is so much more deadly than flies and where fish under the legal size are apt to be taken any size limit is futile unless coupled with restrictions against natural bait.

Carefully conducted experiments in Michigan, both in hatchery raceways and on sections of natural streams, have shown that 37% of the undersized trout taken on worms are killed in contrast to 3% when taken on an artificial fly.

In streams where conditions are suitable for trout throughout the year and natural reproduction occurs (and there are many such streams in Pennsylvania) a size limit

higher than six inches would be desirable. I am not referring to the small mountain streams where the temperatures run low and where trout rarely exceed six inches in length and mature at the four to five inch size. On these streams there should be *no* size limit whatsoever. I am referring to streams where the maximum summer temperature may reach but seldom exceeds 75° F. and where the growth rate is normal. On such waters a nine or ten inch size limit is essential in order to protect the breeding stock and to insure adequate natural reproduction. This higher size limit would have no value, however, if not coupled with restrictions against natural bait. Artificial lures other than flies could be permitted without significantly higher mortality. Again, Michigan pioneered in research to determine the mortality caused by hooking undersized trout with artificial lures such as the Dardevle, Colorado Spinner, Mepps Spinner and Flatfish. The general conclusion from these experiments was that the kill of sublegal trout is not significantly greater with these lures than when the artificial fly is used.

A recent personal experience in fishing Lyman's Run in Potter County, may be cited as an example of the value of fly restrictions. This is the third year that the order has been in effect on Lyman's Run. I happened to fish it in June of the first year of the order. The only trout I could catch were those recently released from the hatchery and there seemed to be no evidence of natural reproduction. The same section of the stream was fished again this past June at about the same time of the year.

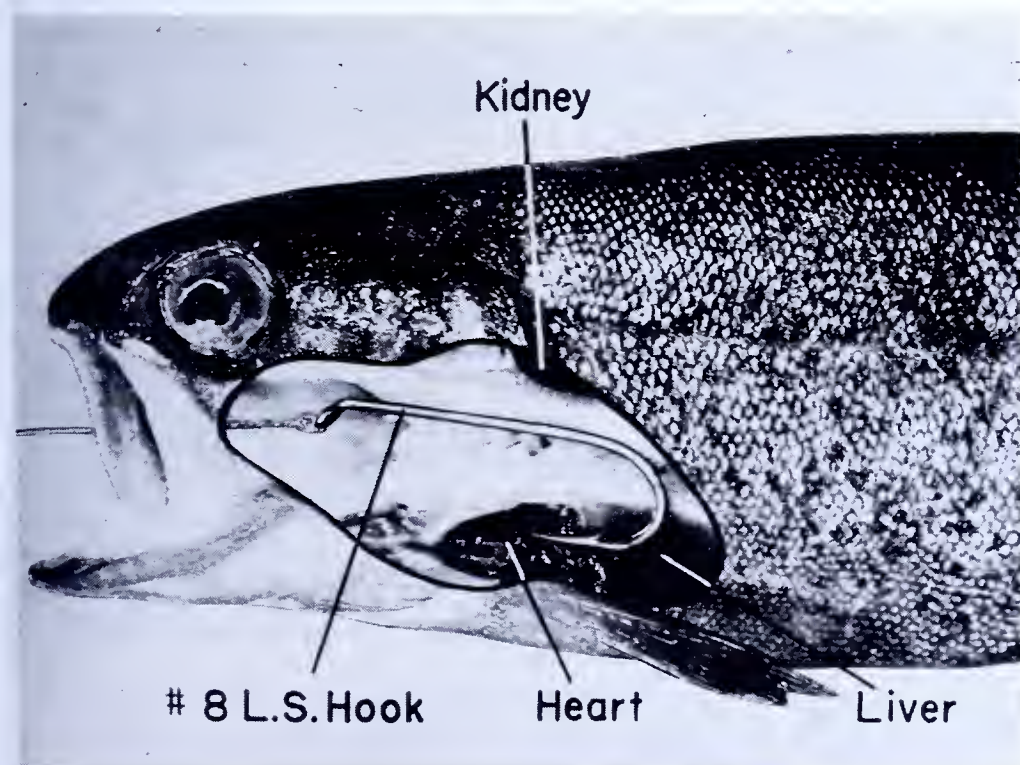
The stream was found to be alive with brook and brown trout and during three days our party caught at least a hundred ranging in size from four to nine inches, most of which I am quite sure never saw a hatchery. Fingerling

trout of this past year's reproduction were observed everywhere along the stream.

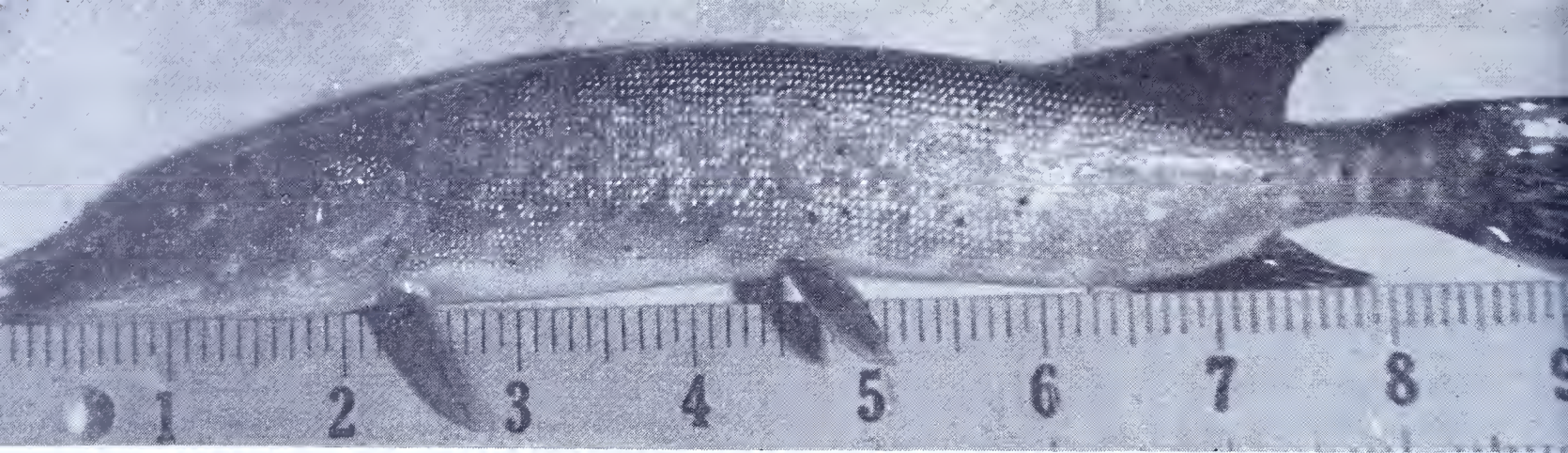
Turn now to the put-and-take streams such as Muddy Creek in York County. In this stream temperatures normally exceed the maximum tolerable by trout by the first of July in all except a few spring-fed pools. In the fly section one can procure plenty of action from trout up to about that time whereas in the sections planted in exactly the same way where any type of lure is permitted, fishing is rated very poor a few days after the stocking. The explanation is simple. Most of the planted trout range in size from seven to ten inches in length with perhaps 20% of them nine inches and better. In the fly section, trout under the nine inch size are caught and released with very little mortality, whereas in the bait section all of the planted trout are legal and are removed usually the first time they are caught. In the fly section the trout grow into keeper size as the season progresses, but in the meantime furnish action for many anglers.

Another argument for the flies-only streams is that a number of these would not be open to public fishing at all unless under these restrictions. Landowners appreciate the lighter and more uniform fishing pressure generated on fly stretches and many owners have stated that they seem to appeal to a more considerate group of anglers who are more appreciative of the privilege of fishing and do less damage to the private property which they are using.

Finally the emphasis of these fly fishing areas is on the recreational value of trout fishing and not the return in terms of meat. Many anglers fish these sections rarely keeping any trout at all. The Fish Commission feels that they are useful demonstrations and that fly fishing waters should be encouraged.



WHY SWALLOWED HOOK KILLS one out of three trout. (Note the proximity of the vital organs to the gullet. Even the greatest care in removing the hook or cutting it off will not save many fish. The harm is usually done when the hook is set)—photo courtesy Michigan Conservation Department



THIS LITTLE "NORTHERN" must have had the power of positive thinking. Although only 9.8 inches long and one year old, he was sexually mature.

The Age and Growth of the

NORTHERN PIKE

in Pennsylvania

■ Many fishermen are not aware that there is a native population of northern pike in the northwestern counties of the Commonwealth. This may be because the muskellunge fishing in this area has overshadowed the northern pike fishing, or it may be that many people did not recognize the northern pike. In the old Pennsylvania Fish Laws they were known only as "Western Pike" and a name such as this would have only been descriptive to local residents.

The Ohio, Allegheny and Lake Erie drainages have produced northern pike fishing down through the years and good populations are still present in some areas. In Conneaut Lake, last spring, during the research program, 431 pike were taken in trap nets. As high as 93 were taken in one day. All the fish were processed, tagged and returned to the lake.

One of the objects of the research program was to determine the age, growth and length composition of the northern pike in Pennsylvania waters. The northern pike are one of the fastest growing freshwater fishes. In an ideal environment, one pike grew to 17.6 inches from June 25 to October 14, a period of 171 days. From the Youghiogheny Reservoir where pike were first introduced in 1956, many large northern pike were reported taken in 1960. The largest taken, although unconfirmed by Fish Commission personnel, was 39½ inches long and 15½ pounds. If this fish was authentic then this is the fastest growth for this species ever reported.

The northern pike in Pennsylvania are on the extreme southern portion of their range and the growth is much faster than for northern regions. For instance, in Great Bear Lake which is located on the Arctic Circle in Canada, it takes about 7 years before the pike reach 20 inches and 12 years before they reach 30 inches. These growths are hardly comparable with those listed for Pennsylvania.

PART VI

by

KEEN BUSS and JACK MILLER

Fishery Biologists

Benner Spring Fish Research Station

Pennsylvania Fish Commission

As northern pike grow they become increasingly heavier in proportion to their length. A 16 inch fish will weigh about a pound, while a 32 inch fish will weigh from 7 to 10 pounds. An illustration of this proportionate increase in weight is shown in Table I.

The population of northern pike in the Commonwealth's waters are characterized by the fact that they are composed mainly of young fish. Seventy-two percent of the pike taken in nets were two to three years of age. Of course, fish one year old and younger are rarely taken on spawning runs and therefore would not enter in the catch. Less than 3 percent of fish were four years of age or older.

Sixty-six percent of the fish were 16 to 23 inches in length. Only 20 percent were over 23 inches and of these only 3 percent were over 29 inches. Since northern pike males rarely grow over 23 inches in these waters, the population over this length consisted almost entirely of females.

Table II shows the growth of northern pike in four Pennsylvania waters. The pike from Conneaut Marsh were taken in 1948 in a selective net which caught only a certain size. The fish were caught in September after their second summer of growth. These fish averaged 16.7 inches at this time but by back-calculating the lengths, it was found that they grew to 9.5 inches in their first year.



APPLYING TAG to the dorsal fin of a northern pike. These tagged fish will aid in furnishing more detailed information on the habits and growth of this species.



REMOVING scales for age and growth studies

TABLE I
Length-Weight Relationships of 540 Northern Pike
from Pennsylvania Waters

Length in Inches	Average Weight		Number of Specimens
	in Pounds		
10.0-10.9	0.20		1
11.0-11.9	0.40		3
12.0-12.9	0.44		8
13.0-13.9	0.52		17
14.0-14.9	0.69		23
15.0-15.9	0.81		23
16.0-16.9	1.07		35
17.0-17.9	1.14		56
18.0-18.9	1.47		79
19.0-19.9	1.62		53
20.0-20.9	1.90		41
21.1-21.9	2.18		45
22.0-22.9	2.46		45
23.0-23.9	2.74		27
24.0-24.9	3.32		14
25.0-25.9	3.63		15
26.0-26.9	4.06		17
27.0-27.9	4.99		11
28.0-28.9	5.36		10
29.0-29.9	5.45		4
30.0-30.9	6.20		4
31.0-31.9	6.80		4
32.0-32.9	9.90		2
33.0-33.9	10.40		1
35.0-35.9	10.10		2

It can be seen in Table II that in the three major northern pike fishing areas the growth is similar up until the third and fourth years. After the fourth year the samples were inadequate for accurate comparison.

If you're interested in fishing for northern pike in Pennsylvania, some good fishing can be obtained in Conneaut Lake, Conneaut Marsh and Canadohta Lake in Crawford County. In Mercer County, Otter Creek, Sandy Creek, Neshannock Creek and Sandy Lake provide pike fishing. Some northerns are caught in French Creek, Oil City and the Allegheny River. Presque Isle Bay on Lake Erie is another popular pike water.

In addition to these waters, northerns were first introduced in Crooked Creek Flood Control Reservoir in Armstrong County in 1960, Glade Run Lake, Butler County, in 1958; Sugar Lake, Crawford County, in 1957; Eaton Reservoir, Erie County, in 1960; Somerset Lake, Somerset County, in 1958; and the Youghiogheny Flood Control Reservoir in 1956.

All Photos by Johnny Nicklas

TABLE II
Averaged Calculated Total Lengths of Northern Pike
at Each Annulus in Pennsylvania Waters

			YEAR CLASS					
			I	II	III	IV	V	VI
Canadohta Lake	Crawford	Average Length	9.8	19.0	22.6	26.5	29.2	
		Number of Fish	76	66	22	8	2	
Conneaut Marsh	Crawford	Average Length	9.5					
		Number of Fish	59					
Conneaut Lake	Crawford	Average Length	11.7	19.3	23.2	25.0	28.0	33.9
		Number of Fish	217	189	80	9	2	1
Lake Erie	Erie	Average Length	11.8	19.1	23.9	27.7	31.1	
		Number of Fish	130	105	60	39	7	
Average Size for Four Water Areas			10.7	19.1	23.2	26.4	29.4	33.9

Information



Please!



STRIPPING eggs and sperm.

By **KEEN BUSS**
Fishery Biologist

Benner Spring Fish Research Station
Pennsylvania Fish Commission

Johnny Nicklas Photos

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■ Trout eggs in a hatchery are of prime interest to visitors. When visiting a fish cultural establishment the interest is aroused and they begin to play their guide with questions. Some of the questions are difficult to answer but most can be answered from data gathered over the years from trout culture work and research. We have listed below a series of questions which are generally foremost in the minds of the visitors. The answers are derived from research data at the Benner Spring Fish Research Station. It should be noted that the fish from which the data were gathered were very select brood stock and in some instances would not necessarily apply to wild trout or run-of-the-mill brood trout.

In some cases, the answers are based for all species of three year old brood stock so that a direct comparison can be made.

- Q. When do trout spawn?
- A. Brown and brook trout spawn in the fall, usually between October and December. Rainbow trout, although originally spring spawners, now spawn in the fall about the same time as brook and brown trout.
- Q. How old are trout when they are spawned for the first time?
- A. Brook trout are usually spawned at two years of age, brown and rainbow trout at three years of age.
- Q. How long does it take trout eggs to hatch?
- A. The length of the incubation period depends on water temperature. At 50°F. rainbow trout eggs hatch in about 35 days, brook and brown trout about 48 to 50 days.

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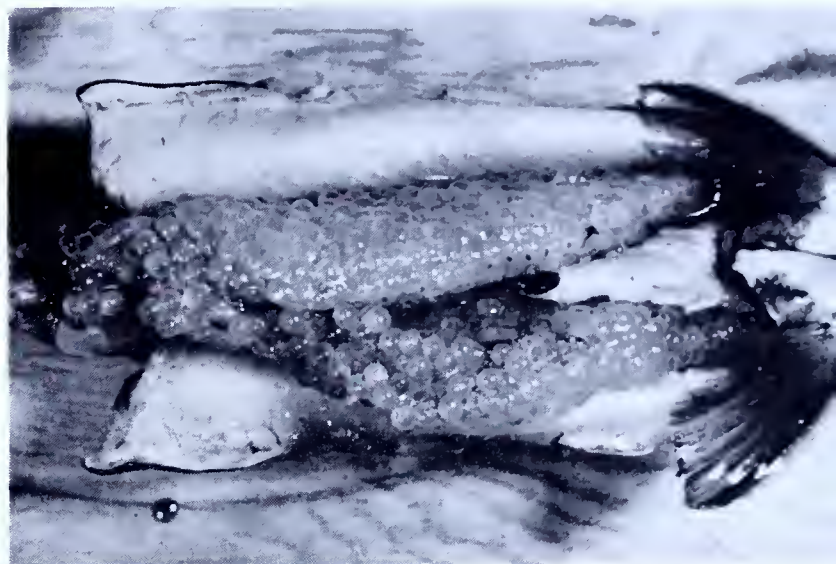
- Q. How large are three year old brood trout?
- A. Brook trout average about 17 inches in length, brown trout about 19 inches and rainbow trout about 24 inches.
- Q. How heavy are brood trout at three years of age?
- A. Brook trout weigh about 2.5 pounds, brown trout 3.0 pounds and rainbow trout weigh about 6.0 pounds.
- Q. How many eggs do three year old hatchery trout produce?
- A. Brook trout produce about 4,580 eggs, brown trout about 4,760 eggs and rainbow trout about 4,500 eggs.
- Q. On the basis of the previous answers is it safe to assume that on the average all three species of three year old trout produce an equal number of eggs?
- A. No, when the data are broken down in eggs produced-per-pound of fish, it is quite different. Brook and brown trout produce twice as many eggs as rainbow trout per pound of fish.
- Q. How large are eggs from three year old trout?
- A. If the eggs were laid end to end, on a six inch rule, it would take 35 brook trout eggs, 33 rainbow eggs and 31 brown eggs to cover the rule. Brown trout eggs are obviously the largest.
- Q. How many years can you spawn trout?
- A. Some seven year old rainbows were spawned last fall. The eggs hatched well.

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- Q. What is the greatest number of eggs recorded from one female?
- A. One six year old brown trout produced 20,865 eggs. (See ANGLER—June, 1959). This is far above the 6 to 10,000 predicted for a fish her size—26.5 inches, 13.4 pounds.
- Q. Would the answers to these questions apply to wild trout?
- A. It is very unlikely, since wild trout are in an entirely different environment. A small wild brook trout may only produce a few hundred eggs.

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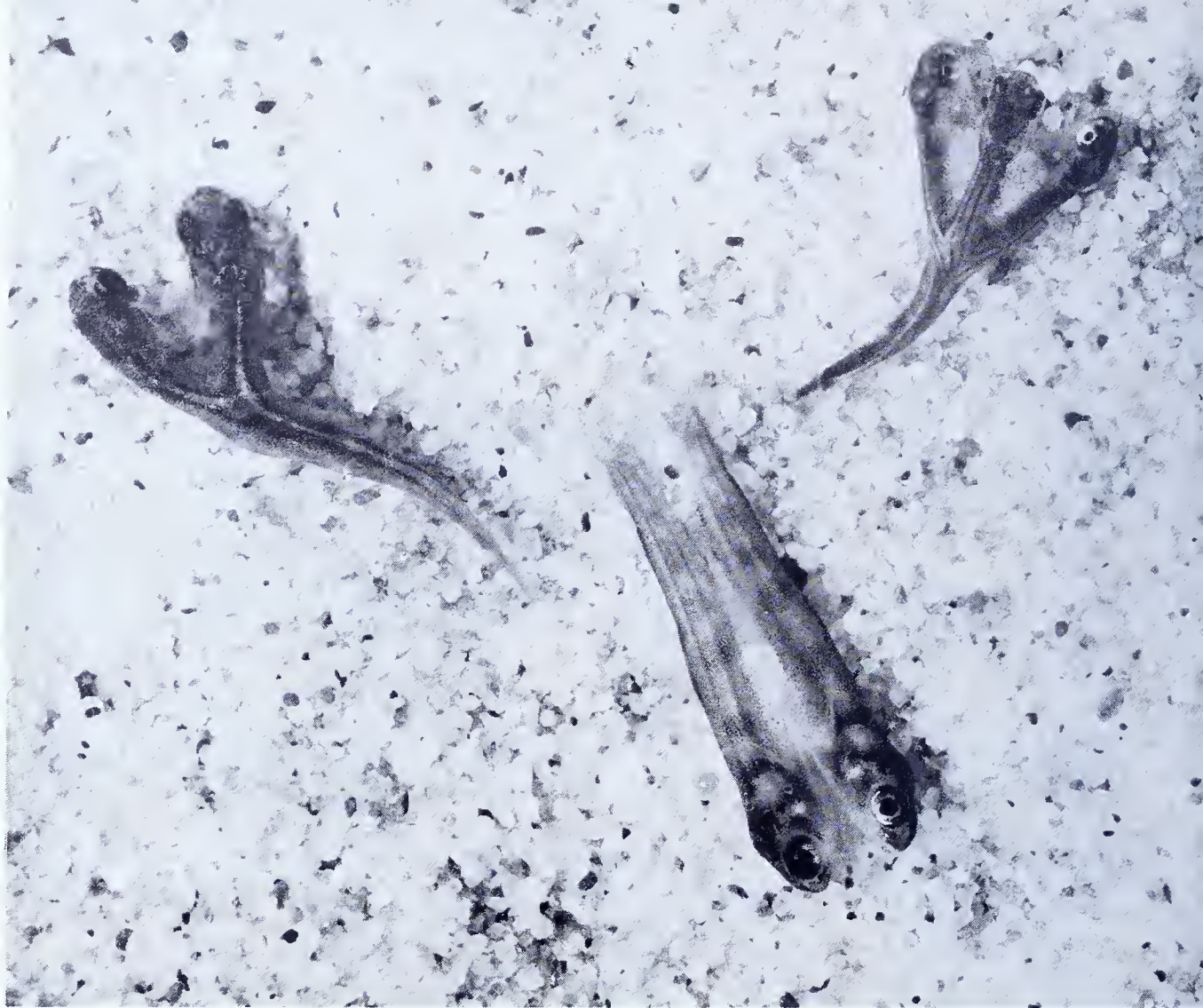
We hope that the foregoing knowledge supplied by the questions and answers listed above will make your next visit to a hatchery more educational and enjoyable.



DISSECTED BROOK TROUT showing how the eggs are arranged in the abdominal cavity.



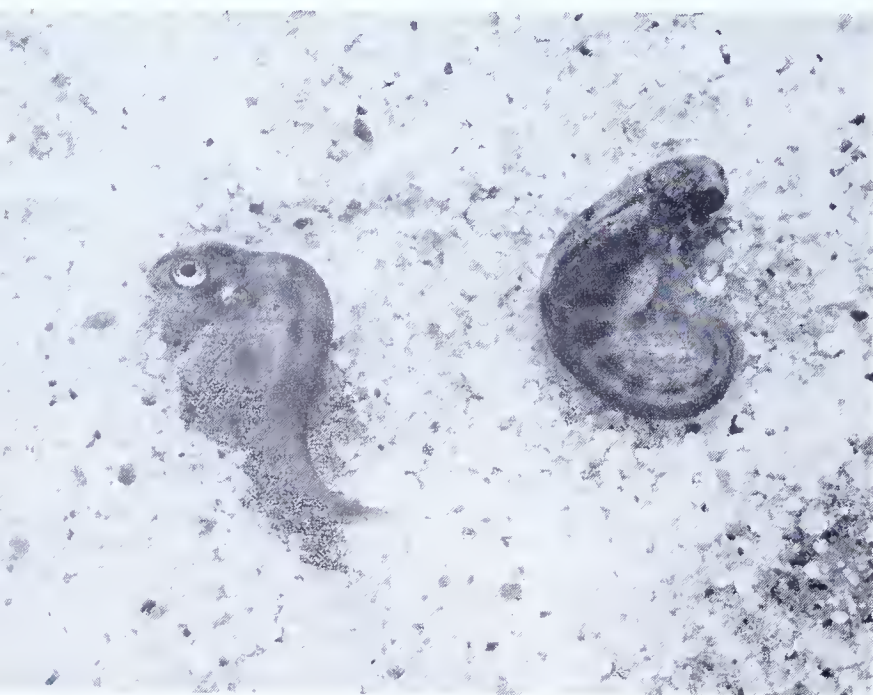
LARGE FEMALE RAINBOW TROUT. The eggs she produced are shown in the graduate on the left.



BROOK TROUT mutation, two-headed, Siamese and 3-headed, about 1 month old

—photographs by W. T. Davidson

BROOK TROUT, twisted backbones, 1 month old



BROOK TROUT, normal, 1 month old

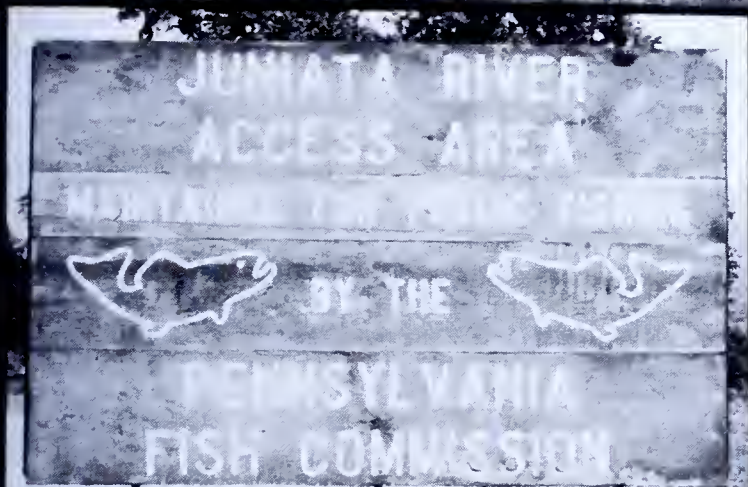


PENNSYLVANIA FISH COMMISSION



**PUBLIC
FISHING
AND
BOATING
PROPERTIES
AND
FACILITIES**

1961



*Directory
for
Fishermen
and
Boatmen*



Pennsylvania Fish Commission Public Fishing and Boating Properties and Facilities

Property	County	General Location	Leased (L) Owned (O) Easement (E)	*Property Size and Type				*Facilities Fish Commission Constructed				
				Total Area acres (a) miles (m)	Lake (acreage)	Stream	Warm water (w) Trout water (t)	Access	Launching	Docking	Parking	Sanitary
Waynesboro Reservoir	Adams	9 mi. E. of Mt. Alto off Rt. 233	L	35 a	26 a		t-w	X				
Gordon Lake	Bedford	4 mi. S. of Bedford Valley off Rt. 220	L	133 a	133 a		t-w	X				
Koon Lake	Bedford	6 mi. S. of Bedford Valley off Rt. 220	L	258 a	258 a		t-w	X				
Wills Creek	Bedford	In Hyndman on Rt. 96	E	.4 m		X	t					
Charming Forge	Berks	1 mi. N. of Womelsdorf on LR 06051	O	22 a	10 a		w				X	
Schuylkill Canal	Berks	2 mi. S. of Hamburg off Rt. 122	O	12 a	12 a	X	w					
N. Br. Susquehanna R.	Bradford	2 mi. NE of Sayre on LR 08077	O	16.4 a			w	X	X			
Levittown Lake	Bucks	In Levittown off Rt. 13	O	30.7 a	20 a		w	X				
Glade Run Lake	Butler	1 mi. E. of Coopersburg off Rt. 8	O	145 a	60 a		t-w	X	X			X
Dunan Dam	Cambria	3 mi. N. of Belsano on Rt. 933	O	58 a	20 a		w	X	X			X
Sinking Creek	Centre	1/2 mi. S. of Tusseyville on TR 409	O	141 a	to be constructed		t					
Spring Creek	Centre	3 mi. S. of Bellefonte off Rt. 545	O	5.3 m		X	t					
Teedale Lake	Chester	5 mi. E. of Honeybrook off Rt. 322	O	50 a	18 a		w	X	X			X
Clarion River	Clarion	SGL #74 at Mill Creek	L			X		X				X
Fishing Creek	Columbia	At Orangeville on Rt. 93	O	0.5 m		X	t					
Canadohta Lake	Crawford	1 mi. N. of Lincolnville on LR 20139	O	4.5 a			w	X	X			
Conneaut Lake	Crawford	2 mi. S. of Harmanburg off Rt. 618	O	2 a			w	X	X			
Cussewago Creek	Crawford	1/2 mi. W. of Meadville on Rt. 98	O	6.1 a		X	w	X	X			
Drakes Mill Dam	Crawford	2 mi. NW of Cambridge Springs on Rt. 99	O	75 a	53 a		w	X	X			
French Creek	Crawford	1 mi. NE of Cambridge Springs on LR 20076	O	10 a		X	w	X	X			
French Creek	Crawford	At Saegertown on Rt. 6	O	1 a		X	w	X	X			
French Creek	Crawford	2 1/2 mi. S. of Meadville off Rt. 322	O	15 a		X	w	X	X			
Sugar Lake	Crawford	5 mi. NE of Coelbranton off Rt. 78	O	Lot			w	X	X			
Big Spring	Cumberland	4 mi. S. of Newville on Rt. 891	L	.75 m		X	t	X				
Opposom Creek	Cumberland	6 mi. NW of Carlisle off LR 21033	O	214.18 a	60 a		w	X	X			
Yellow Breeches Creek	Cumberland	At Huntsdale off LR 21008	O	1.1 m		X	t	X				
Conodoguinet Creek	Cumberland	1 mi. NW of Silver Springs 1 mi. off Rt. 11	O	1/2 a		X	w	X				
Beaver Dam Run	Erie	1/4 mi. S. of Elgin off LR 25042	E	1.1 m		X	t	X				
S. Br. French Creek	Erie	1 mi. E. of Elgin on LR 25046	E	2.7 m		X	t	X				
S. Br. French Creek	Erie	1 mi. E. of Elgin on LR 25046	O	7.5 a			t	X	X			X
Virgin Run Lake	Fayette	1/2 mi. N. of Flat Woods on LR 26123	O	135 a	35 a		w	X				
Tubbs Run	Forest	At Tionesta off Rt. 62	O	5.2 m		X	t	X				
Dickens Creek	Franklin	4 mi. N. of Mercersburg off Rt. 75	O	.9 m		X	t	X				
Letterkenny Reservoir	Franklin	3 mi. W. of Roxbury off Rt. 641	E	128 a			t	X				
Meadow Grounds	Fulton	3 mi. W. of McConellsburg off Rt. 40	L	250 a	to be constructed		t	X				
Juniata River	Juniata	2 1/2 mi. E. of Mexico off Rt. 22	L	6 a		X	w	X	X			
Chapman Lake	Lackawanna	2 mi. N. of Montdale off Rt. 247	O	Lot			t	X				
Rock Hill Dam	Lancaster	2.6 mi. N. of Safe Harbor off LR 814	O	5 a		X	w	X				
Conestoga Creek	Lancaster	1 mi. S. of Millersville on LR 36008	O	1.0 m		X	w	X				
Little Conestoga Creek	Lancaster	1/2 mi. S. of Rockhill on LR 814	O	.4 m		X	w	X				

Property	County	General Location	Property	County	General Location
Larry's Creek	Lycoming	3 mi. NE of Salladasburg on 973	L	A	
Roaring Branch Creek	Lycoming	3 mi. W of Roaring Branch on LR 41043	E	X	
Bradys Lake	Monroe	9 mi. NE of Blakeslee off Rt. 940	L	250 a	190 a
Gouldsboro Lake	Monroe	In Gouldsboro off Rt. 611	O	325 a	278 a
Juniata River	Perry	2½ mi. S. of Millerstown off Rt. 22	O	6 a	
Juniata River	Perry	½ mi. E. of Newport off Rt. 22	L	17 a	
Fairview Lake	Pike	½ mi. S. of Tafton off LR 51028	O	Lot	200 a
Greely Lake	Pike	½ mi. W of Greely off TR 415	O	2.3 a	60 a
Middle Creek Lake	Snyder	1.5 mi. S. of Selinsgrove off Rt. 15	O	143 a	100 a
Cranberry Glade Lake	Somerset	8 mi. N. of Confluence off LR 55021	L	150 a	
Lake Somerset	Somerset	½ mi. N. of Somerset off Rt. 219	O	468 a	253 a
Youghiogheny Reservoir	Somerset	8 mi. S. of Confluence off Rt. 40	L	1360 a	1000 a
Stump Pond	Susquehanna	4 mi. E of Milford on Rt. 492	O	22 a	12 a
Roaring Branch Creek	Tioga	1½ mi. W. of Roaring Branch on LR 41043	E	1 m	
Allegheny River	Venango	In Kennerdell off TR 60011	O	2 a	
Oil City Access Area	Venango	½ mi. SW of Oil City on Rt. 62	L	1.2a	
Cannonsburg Lake	Washington	3 mi. E of Cannonsburg on Rt. 19	O	130 a	75 a
Dutch Fork Lake	Washington	4 mi. W. of Claysville off Rt. 40	O	588 a	
Allegheny River	Warren	2 mi. N of Tidoute on Rt. 62	O	1 a	
Brokenstraw Creek	Warren	In Columbia on Rt. 957	O	7 a	
Belmont Lake	Wayne	3 mi. N. of Pleasant Mount on Rt. 670	O	560 a	172 a
Alder Marsb Creek	Wayne	3 mi. W. of Rileyville on Rt. 371	E	.25 m	
E. Br. Dyberry Creek	Wayne	3 mi. E. of Rileyville on Rt. 371	E	2.5 m	
Equinunk Creek	Wayne	4 mi. SE of Lake Como off Rt. 247	E	1.2 m	
Fork Mountain Lake	Wayne	5 mi. SE of Lake Como on LR 63041	L	60 a	60 a
Lake Lorraine	Wayne	2 mi. E of Orson on Rt. 370	L	65 a	65 a
Long Pond	Wayne	2 mi. NE of Aldenville off Rt. 170	O	450 a	60 a
Long Pond	Wayne	3 mi. SW of Lake Como off Rt. 247	L	70 a	70 a
Lower Woods Pond	Wayne	3 mi. W of Rileyville off Rt. 371	O	391 a	91 a
Miller Pond	Wayne	5 mi. E of Pleasant Mount off Rt. 247	O	97 a	61 a
Reinings Pond	Wayne	4 mi. W of Honesdale on Rt. 943	O	250 a	43 a
Upper Woods Pond	Wayne	2½ mi. N. of Cold Spring on LR 63041	L	100 a	78 a
W. Br. Lackawaxen Cr.	Wayne	At Pleasant Mount off Rt. 371	O	1.3 m	
White Oak Pond	Wayne	¼ mi. W of Aldenville off Rt. 110	O	257 a	134 a
Duck Harbor Pond	Wayne	3 mi. SW of Hilltown 1½ mi. W of Rt. 90	O	2 a	300 a
Burcher Property	Wayne	½ mi. SW of Narrowsburg on Rt. 106 (Del. R.)	O	¾ a	
Dexter Property	Wayne	½ mi. SW of Narrowsburg on Rt. 106 (Del. R.)	O	¾ a	
Lake Dom	Westmorland	2 mi. E of Crabtree on 64147	O	14 a	8 a
Bowman's Creek	Wyoing	3 mi. S of Tunkhannock on Rt. 309	E	2.7 m	
Meshoppen Creek	Wyoing	5 mi. E. of Meshoppen on LR 65037	E	1 m	
Mud Pond	Wyoing	5 mi. N of Tunkhannock off Rt. 29	O	87 a	56 a
N. Br. Susquehanna R.	Wyoing	1 mi. S. of Tunkhannock off Rt. 309	O	1 a	
Laceyville	York	In Laceyville on Rt. 6	L	4 a	
Wrightsville	York	In Wrightsville on Rt. 30	L	10.8 a	
Goldsboro	York	Goldsboro Boro	L	¼ a	

Acquisitions completed after above was compiled. Development to commence as funds and manpower are available:

Property	County	General Location	Property	County	General Location
N. Br. Susquehanna R.	Bradford	2 mi. S. of Towanda on L.R. 08107	N. Br. Susquehanna R.	Susquehanna	SGL 35 ½ mi. S. of Hallstead
N. Br. Susquehanna R.	Bradford	at Terrytown on T 450	Allegheny	Venango	Elk Street in City of Franklin
Delaware	Bucks	Yardley Boro	Allegheny	Warren	½ mi. So. of Hunter Bridge on Rt. 537
Delaware	Bucks	Upper Black Eddy	Allegheny	Wayne	River Road—Starbrick
Lake Erie	Erie	2 mi. W. of Erie on Manchester Road	Delaware	Wayne	1½ mi. N. of Equinunk on Rt. 90
Juniata R.	Juniata	½ mi. N. of Mexico on T. R. 380	Delaware	Franklin	3 mi. N. of Equinunk on Rt. 90
Schuylkill R.	Montgomery	at Pennhurst School on SGL 235	Chambersburg Reservoir	Sullivan	2 mi. N. Rt. 30, Michaux St. Forest
			Hunter's Lake		2 mi. N. of Muncy Valley on Rt. 42

a program to increase

FISHING and BOATING

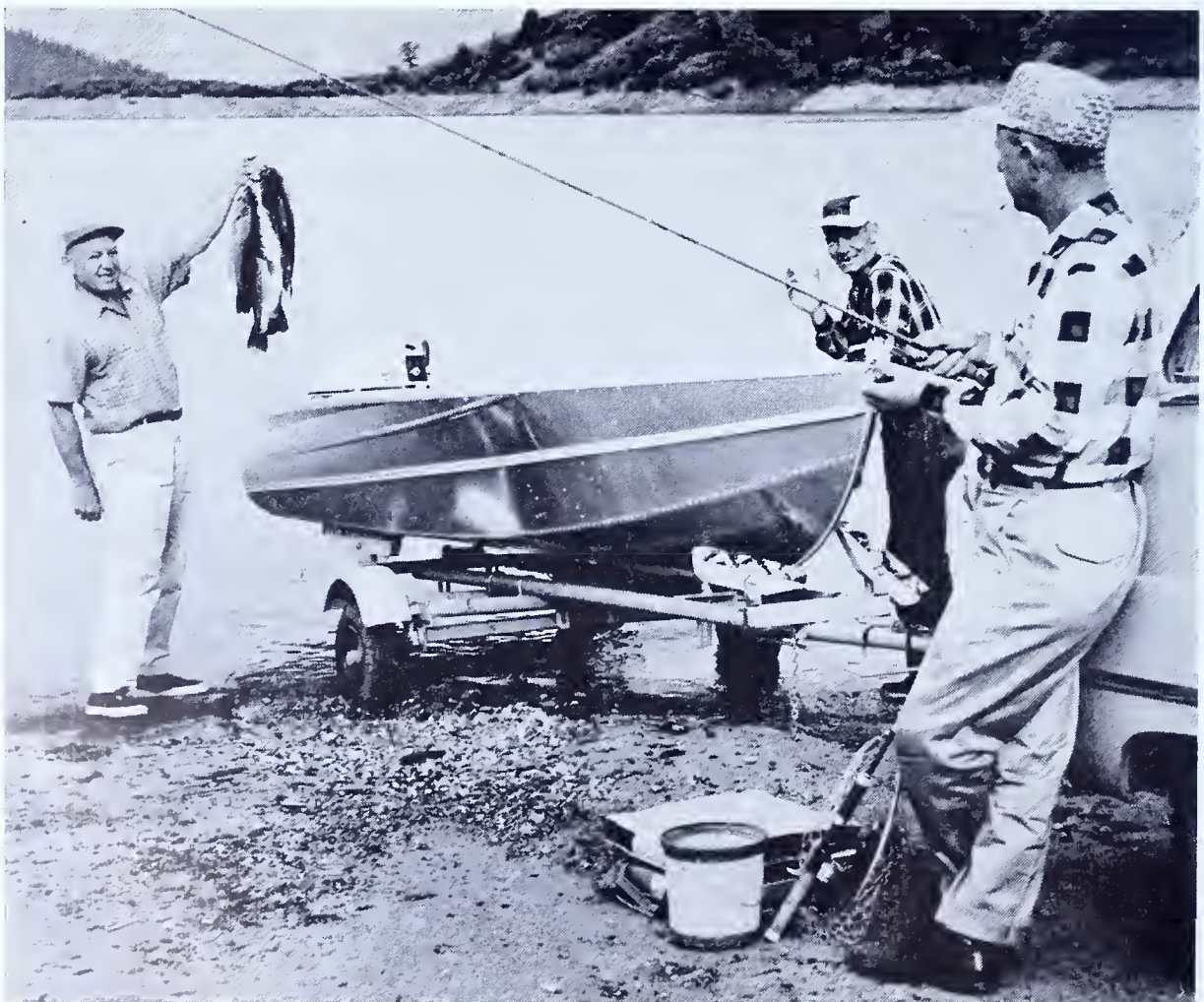
opportunities in Pennsylvania

For many years the Pennsylvania Fish Commission has been aware of the increasing demand for fishing and boating waters by citizens of the Commonwealth. The Commission also has realized that, in many cases, it has become increasingly difficult for fishermen and boaters to gain access to publicly owned waters of the state.

Starting early in 1956, the Commission instituted an accelerated program of building new lakes and acquiring and developing access areas along waters, some of which, although open to public use, were little used by boaters and anglers for want of places to get to them. Others were private or closed to the public entirely.

In a program financed by fishing license fees, supplemented by federal funds provided by the Dingell-Johnson Act, the Fish Commission has been able to provide or increase access to the areas listed in this pamphlet. The Commission plans as rapidly as possible to continue to expand this program. Every effort is made to secure the fullest possible cooperation of all other state and federal agencies in any projects which will increase the multiple use of the Commonwealth's water resources.

The summary on these pages does not include all the waters involved in the efforts listed above. Rather, it is only of properties owned, leased or otherwise controlled by the Fish Commission as of the end of 1960. In the foreseeable future, the list will grow in total numbers as the Commission continues with the construction or major reconstruction of impoundments and the acquisition and development of new access sites.



Sucker Fishing

BY CHARLES M. WETZEL

■ I have always been glad that I am a Pennsylvania Dutchman. I was brought up in a small town and we had none of the new labor saving devices that make life easier. Everyone talked Pennsylvania Dutch—went to church and Sunday school regularly or else took a licking—and all worked hard except those afflicted with the curse of drinking or fishing. And it is with the latter people that I write about.

In those early days John Rhamstine and I were inseparable companions. I well remember the first time we went fishing together. John's mother said:

"Now John, take care that you don't fall in and bring Charlie along home for supper. I'll make dandelion, boiled potatoes and bacon."

My, oh my, and did that taste good after the long walk home from the creek! I can still hear her saying:

"You're not eating Charlie. Is something wrong with your appetite?"

Money was scarce in those early days but we were always assured of a sufficient amount to buy hooks and tackle through the generosity of John's Aunt Nanny. Aunt Nanny was a small, dried up, wrinkled old maid and she lived by herself in a small whitewashed log house near the middle of the town. She smoked a short stemmed clay pipe, the stem so short, that we often marveled that the bowl did not burn the end of her nose. She was a good doctor; had learned to Pow-Pow when she was a child; and she could help anyone when they were in pain. She believed in roots and herbs and these together with a few words mumbled to herself, was all that was necessary to make people well again. She was a little eccentric about her chickens and every Saturday she hired us to move her chicken house to a new place. For this work she gave us ten cents, enough money to buy fishing tackle.

Middle Creek, where we did our fishing, was about three miles away from the town. It contained sunfish, catfish, pike, bass, suckers, fallfish and red headed chubs which were locally called Red Bingamans. Our tackle was a long bamboo pole, line, cork, hook and sinker. With this outfit we always kept the two families in fish.

Every year on Ascension Day everyone went fishing. Like all others, Dad would load the entire family up on the surrey . . . a wagon with lots of seats, the occupants being protected from the sun by a flat roof whose edges would be ornamented with tassel-like fringes. Then we would start out fishing! Mother always brought along plenty to eat in the basket. There was fried ham, butter bread, hard boiled eggs in pickled red beets, brick cheese, chow-chow, cold slaw, potato chips, ginger snaps, apple pie, layer cakes; and salt, pepper, flour, lard and frying pan to fry the fish. Many similar parties were around and quite often two or three families would unite in one large merry group.

Mother liked catfish and it was always a mystery to people how John and I caught them in the middle of the day when the water was clear. The way we caught them was original with us. If the water was not dirty, we made it that way. One of us would go up stream and stir up the stones on the bottom. The dirty water would then work down into the pool and the catfish would start biting. We always pulled straws to find out which one was going to make the water muddy, as both of us wanted to fish.

In the spring the suckers would start moving up stream and on warm sunshiny days we caught plenty of them on worms.

I well remember some of the old sucker fishermen. There

was old Ike Boush with whiskers trailing down over his chest, whom we passed every day going to and from the creek. Over his shoulder he carried six long fish rods and he never said a word to us as he passed by. He did not get along well with people and he had no use whatever for the younger generation. But he could catch suckers! He wouldn't tell us how it was done so we learned what we could by spying on him. After a while we also came home with plenty of fish, and when we passed him he glared at us as if we were snakes.

After the water grew warm the suckers stopped biting; and then we had to catch them by looping or hooking them. I might say that I hooked many fish in my time. This is the method of procedure:

When they are lying on the bottom one must work a treble hook under their nose, give a yank to the line, and then throw them out. Sometimes the suckers were restless and would not lie still; a remedy which called for considerable stoning of the pool, after which they would settle down exhausted on the stream bed. Many a time during the summer we went home with all the fish we could carry. The-loop also worked well. A fine piano wire noose was slipped over the head of the fish and they were then pulled out. It is perhaps a good thing that they can no longer be caught this way.

One day while returning home from sucker fishing I happened to pass by the old red covered bridge and stopped for a minute to look down into the water. Slightly farther up stream Old Ike was fishing and swearing to himself for the fish wouldn't bite.

"I wonder what the devil is the matter with them," he mumbled.

Under the bridge in the slightly cloudy water was a school of suckers. I couldn't see the hook to hook them for the water was too cloudy, and I was more or less at a loss to proceed, knowing that the water was getting too warm for them to take bait. Then I had a bright idea! I had a tube of white oil colors in my tackle box and I painted the treble hook with it. In the dirty water it glittered and was easily seen.

I had caught about a dozen or so when Old Ike walked down. They were not biting up stream and he thought that I had struck a bonanza.

"Young Wetzel, I would like to fish by you" he said. This must have been torture to him for heretofore he never even condescended so much as to say a word to me.

"Alright," I answered, "You may."

Old Ike threw his six lines out into the water then settled back to await developments. Every time I would catch a sucker he would pull in his six lines and put on fresh worms. His vision was poor and he couldn't see the suckers lying directly below him. Ike then noticed me squeezing out the last of the white paint on the hook.

"What have you there?" he asked.

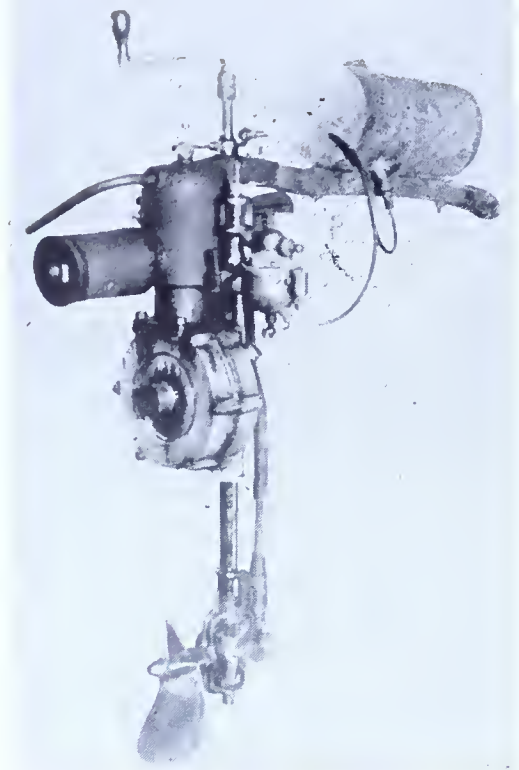
"Oh, it is something new to catch fish." I answered.

The old fellow didn't say a word for at least five minutes. Was he thinking to himself that he should have been kinder when he daily passed us? Perhaps that was the case for he grew very humble.

"Young man, I would like to try that fish lure. You and I could soon be rich manufacturing it."

Then I gave Old Ike a dozen of the fish for I wanted to remain friends with him. I have often wondered what his thoughts were as I left him there by the bridge, his six long fish rods stretched out over the water. . . .

from bicycle motors and ice cream freezers



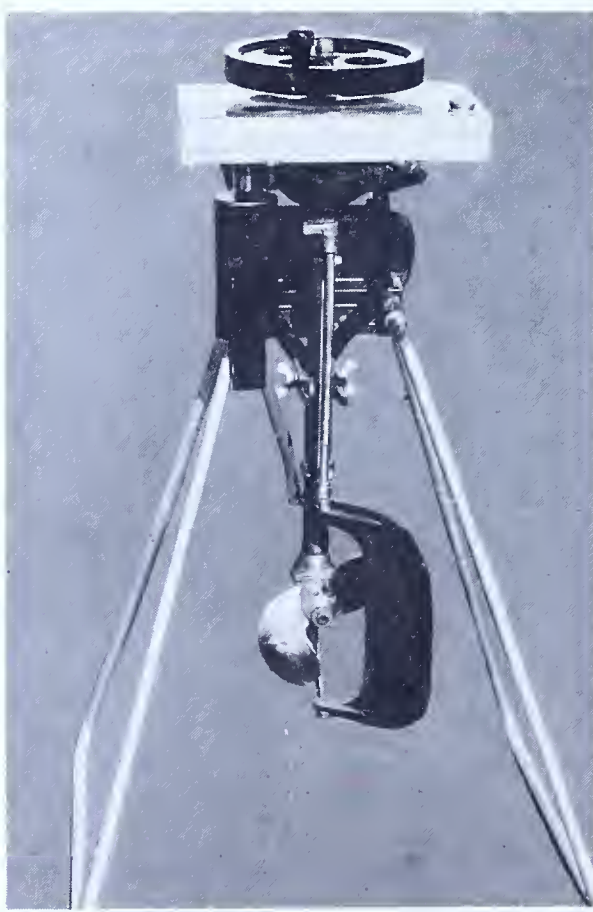
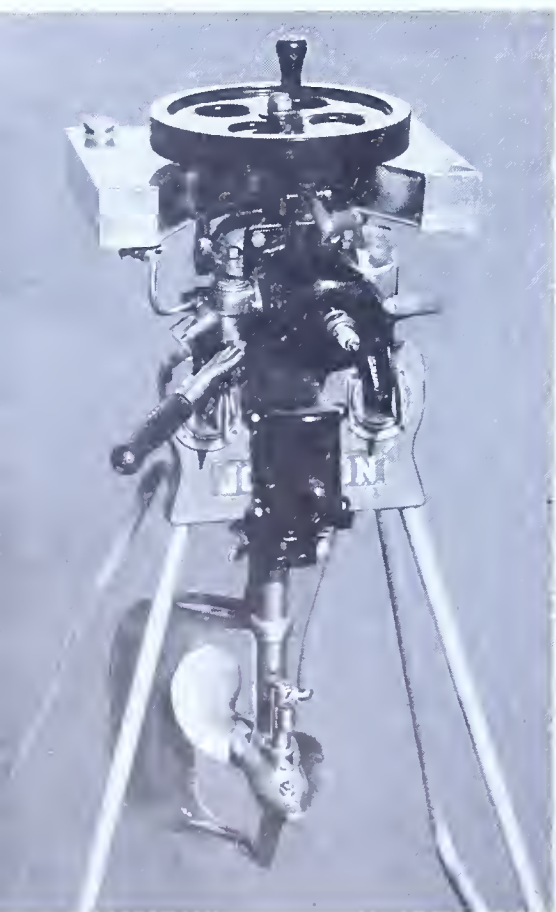
The Waterman Porto Motor original production model in 1905—the first real production outboard motor. Note the flywheel positioned vertically and in a housing below the cylinder. Also, the exposed beveled gear arrangement off the drive and prop shafts. (Photo—courtesy of the Kiekhaefer Corporation)

■ When one walks into the Peters Marine Service in Allentown's (Pa.) east side, he walks into a bit of outboard motor history. On a rack alongside the sparkling array of latest sleek and powerful kickers, is a Waterman Porto motor, circa 1908, built by Mameron B. Waterman.

It's a contrast no less startling than a brass trimmed model "T" flanking the automobile industry's latest advances.

Though it's not the first of Waterman's model, nor was Waterman the first to fabricate an "outboard" motor, it is a model out of the infancy of today's outboard motor industry.

Actually, gasoline powered in the United States date back to 1892, when William Steinway of piano fame, and



—Johnny Nicklas Photographs

Waterman Porto Motor, 1907-1909 model, front, back and side views. Note repositioning of flywheel, combining it with starter, also housing of gears and rudder. Rudder, mounted off drive shaft housing, the skeg operated by lever and another gear arrangement under cylinder, a distinguishing feature of this motor. All parts are original except coil, muffler, steering lever grip and water lines. Original coil had deteriorated, replaced with one of modern vintage. Original muffler corroded, rubber grip and water line have been replaced, motor is again in excellent running order.

Outboard is Born

BY BOB GLOVER

Gottlieb Daimler of Germany, displayed their product at the Chicago World's Fair.

Historians have found records of other attempts by a few other individuals. But each, for one or more of several reasons, faded from the picture. Among that small group was an air-cooled model by Waterman.

Like most advances which constitute the "machine age," the outboard motor was born out of the desire to substitute mechanics for muscle. Waterman just got tired of rowing to his favorite fishing area. Incidentally, at the time of his invention he was a 28-year-old law student at Yale University.

Along the same vein, three years later, in the summer of 1908, a pair of blistered hands and some melted ice cream set Ole Evinrude to work. While picnicking with Bess Cary, his wife-to-be, and several friends on an island some three miles from the nearest town, the future Mrs. Evinrude allowed how nice it would be to have some ice cream. Ole tried to oblige. Out of the experience came another forerunner of today's outboards and one which still bears his name.

However, by the time he got his "Evinrude Detachable Rowboat Motor" on the market in 1909, Waterman's Porto Motors were gracing the sterns of upwards of 12,000 boats. For the most part, those 12,000 motors represented the third basic model to bear his name.

Waterman's first, which he built himself in 1905, incorporated an air-cooled bicycle motor and a chain driven prop. The chain drive principle was abandoned after one field test on the Detroit River. The chain was too easily knocked off the lower and submerged sprocket.

Early the following year, in collaboration with a close friend, George Thrall, owner of a Detroit boiler factory, Waterman developed a drive shaft and beveled gear arrangement.

Later, in 1906, the unique engine was exhibited at the National Motor Boat Show in the old Madison Square Garden in New York. Twenty-five were sold in that year.

In 1907, Waterman and Oliver E. Barthol, an engineer, joined forces to further refine the motor, including a switch to a water-cooled, single-cylinder, two-cycle engine. In that and the following year they built and sold 6,000 outboards. In 1909, another 6,000 were marketed.

It's one of these 1907-1909 models that came into the possession of John Peters of the marine service in Allentown. Peters purchased his antique 27 years ago from a doctor whose name cannot be recalled. The doctor inherited the motor from his father, who was the original owner.

In addition to "beginning an industry" with the first "mass" production of a "new contraption," Waterman

coined the term "outboard motor." He was unable to copyright it, however, because of its generic derivation. In his patent application in 1905, granted in 1907, he described the Porto as a "self contained motor and propeller."

Advertising was another first with which he was credited in the industry. In the January 10, 1908 issue of "Motor Boating" magazine, his ad copy, according to "The Encyclopedia of Outboard Motor Boating" (A. S. Barnes & Company), was as follows:

"Make a motor boat of any boat in five minutes . . . here's a little two horse-powered marine motor (40 lbs. complete) that you can attach to the stern post of your boat in five minutes without any tools.

"Drives an 18 foot rowboat seven miles per hours (runs eight hours on one gallon of gasoline). Can be detached from boat just as quickly and stored in box in which it is carried.

"Simplest motor made, does not get out of order. Money back guarantee. Write for full description and price. Waterman Marine Motor Company, 1520 Fort Street, Detroit, Michigan."

In describing the construction and functioning of the motor, Peters pointed to two of its features that are particularly noteworthy. Its exhaust manifold is of aluminum, a common metal today, but a most modern application of a "new" metal in 1908.

The second feature are the facings on the halves of the crank case. One is ridged and the other grooved. The seal was made with candle wicking. This ridge and a groove feature was abandoned as a production economy move by manufacturers in favor of flat facings and a rubber gasket until 1949. However, it was always a source of trouble. In 1949 Waterman's principle was "discovered" and in conjunction with a neoprene gasket, the trouble was eliminated. Other "advanced" features were the adjustable prop pitch and gears' adjustment facility on the gear housing.

Also of interest were the numerous types of materials used in the Porto's construction. They were brass for the drive-shaft housing; bronze for the gear case, prop and prop shaft, plunger-type water pump, rudder, connecting rod and bearings; steel for the drive shaft, parts of the bracket, muffler, nuts and bolts, gears, piston and piston rings; copper for the gas tank, fuel line and wiring; cast iron for the cylinder block and fly-wheel; aluminum, as mentioned earlier, for the exhaust manifold; rubber for the water line, gaskets and steering grip; bakelite, paper, wax were used in the coil; porcelain on the spark plugs; wood on the fly wheel handle, and lead solder for the gas tank assembly.

The source of power was a 6 volt dry cell battery. All castings were custom made and hand finished, each part identified by a number, stamped into the metal.

The Porto was produced until 1924, by which time some 30,000 were manufactured and sold.

Meanwhile, in 1917 Waterman sold his interest to the Arrow Motor and Marine Company of New York, after which he enlisted in the United States Signal Corps.

After World War I he devoted his energies and talents to a successful law career. However, before his death in 1956 at the age of 79, he had one more burst of glory in the industry. In 1955 he was officially given recognition for his service to that industry at the New York Boat Show on the 50th anniversary of his invention.

It was most fitting that he lived to see the activity he implemented, blossom into the fastest growing family recreation of the last decade of his life.

Material sources for this feature: "Early History of Outboarding"—Mercury Outboards, Fond du Lac, Wisconsin; "The Encyclopedia of Outboard Motorboating, A. S. Barnes & Company, Publishers, New York 16, N.Y.; John S. Peters, Peters Marine Service, Allentown, Pa.



Sassafras Time

■ Since the beginning, in our country, the gathering of sassafras has been an early spring ritual. It is still a pleasant, outdoor diversion. Despite a centuries-old custom, this medicinal tea root is not too well understood by many of this modern age. Often its name is familiar, but where it comes from and how it becomes a usable product is a mystery. A traditional practice is fading.

Only root bark that is well underground is used. It is dug only when the tree is dormant, or as commonly expressed, "the sap is down." Although roots may be dug any time during the winter or dormant period, it is common practice to dig in the early spring, months of March and April.

The tea is believed to be a tonic, conditioner and blood thinner, and is sipped by many to tone-up the system after a long hard winter.

The sassafras is classed as an understory tree, one of the group of hardwoods that grow in and around large hardwoods. A tree of thirty to forty feet high is considered large but they have been known to grow to twice that height. It is easily identifiable by its deeply furrowed bark



SASSAFRAS ROOTS are easily dug in loose woods loam.

when bare of leaves, prefers a well-drained, sandy soil, is common along fence rows and ridges.

The leaves are large, oval-shaped and smooth edged. Some are plain, others have one or two deep indentations, resemble mittens, all are found on the same tree. Tender twigs when chewed have a distinct sassafras flavor, a sure test when locating trees to dig. Roots may be dug from both large and small trees. A section of root may be cut from a large tree without destroying it. In commercial plots small trees are usually up-rooted and all usable root removed. Size does not effect the quality of the root but some trees have much redder root bark. A tree with the reddest bark makes better and more colorful tea. It is almost impossible however, to tell the darker root from the light before it is partially dried. For a guide, expose a thin slice of root bark to sun and air for ten minutes or more. It should turn pink, the pinker the better.

A mattock is the most adaptable tool for uncovering the root. A large root, the size of a mans' leg, can be sawed into shorter pieces for easier scrubbing and shaving. Roots from the small trees may be cut free with a knife or pruning shears. Trim off all rough, scaly bark and fibre root. This tea bark may vary from an eighth to a quarter inch in thickness. Here again, trees of the same group, and likely of same parentage, are similar in bark thickness, as well as color. The thicker bark is to be preferred as it makes a larger amount of dried shavings for a given size root.

A sassafras root is easily cleaned. A stiff-bristled scrub brush and clear water is all that is needed. Take care and do not scrub newly dug root too vigorously. You will wash away the sap. For this reason many sassafras enthusiasts will shake off the loose dirt and dry before washing, then wash only quantities as used.



SCRUBBING with lukewarm water takes off soil

As soon as the root is cleaned and free of excessive moisture it is ready for shaving into thin, narrow strips. Three to four inches is about right for length and as thin as possible. For this, a sharp pocket knife is hard to beat. It is more wieldy than a larger knife, less tiring, and easier to guide for thin, even slices. There will be plenty of short slices and chip-like pieces from around knots, forks, and uneven places on the root. Thin shavings dry quicker, and, of greater importance, more thoroughly.

For drying, the root shavings can be placed on a window screen or paper and dried at room temperature. This will require about one week. Some prefer to use a large, shallow pan or cookie sheet and dry in an oven or warming closet. This is quicker than air drying, but not every one has these old-type facilities available. In drying by room temperature, it is a good thing to dry with low heat the last few hours to insure absolute dryness. This will help prevent the faint mustiness or oldness that may be discernable when the dried bark is sealed-up for long periods. As soon as dry, seal in air-tight jar or cannister to conserve the roots' strength, which will deteriorate if left in the open air. Store like flour or sugar, away from excessive cold or temperature changes that might induce condensation in the tight container.

There are two ways to brew the tea. The first is to place



SHAVING is done after large roots are sawed into easy-to-handle lengths.

a handful of root in a saucepan with the desired number of cups of water, plus one, and boil for a few minutes. The beverage will strengthen if let set a while after boiling. The second method is to pour boiling water over the root, cover and let steep for ten minutes or longer. Pour and sweeten to taste, and drink with or without cream, as you prefer.

Many people still believe in sassafras tea as a conditioner and drink it in preference to any 'store bought' tonic. It would be a bad year indeed, if for some reason they had to miss their spring invigorator and blood thinner. But whatever its medicinal properties may be, it is a pleasant drink, tasty and aromatic.

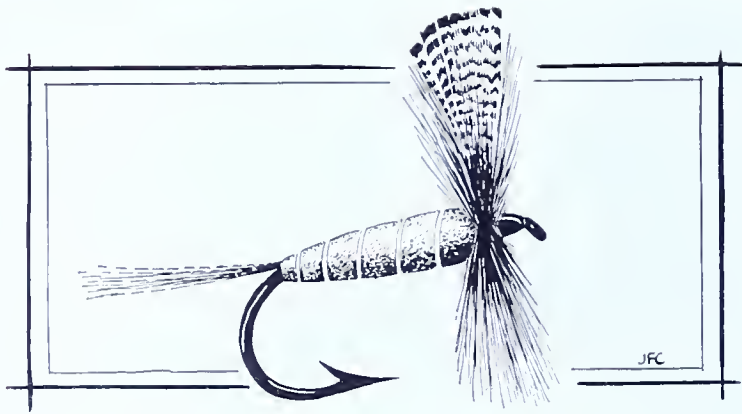
It not only serves as a table treat, but furnishes a good excuse for the outdoor lover to take to the woods in early spring where there are few excuses to get out on week-ends. Pick a nice, bright day, when the sun is biting through the late winter's chill and dig sassafras. You will be following in the countless footsteps of our pioneer ancestors who built the greatest nation ever out of a wilderness. Drinking sassafras tea helped keep them in good trim.

—John G. Lienhard

★

"The rich topsoils, the sparkling waters and rich growth of vegetation, together with its minerals and wildlife, which made this continent the richest prize in the history of civilization are not inexhaustible, in spite of our common habit of thinking so. If intelligently cared for they can be made to last indefinitely and produce abundantly. But if any one of the three is depleted by wasteful practices and slothful mismanagement our American continent will be broken out with a rash which no sociological salve can cure. Then America will not only be unable to 'feed the world' but by its own standards of living will be unable to feed itself."

J. N. "Ding" Darling



Pool Tactics

On our streams there is slight chance finding a secluded spot. Traveling nearby or far away by car, plane, canoe, backpacking the trails—there are trodden paths. Suppose we just breeze-out to nearby pool and try to fool an old brown trout?

In the large pools there are usually one or two big brown trout. These old browns are security-minded with long life-expectancy. Time and care are required to catch them.

Careful approach is essential. Wary browns usually see you when you can not see them. We move slowly, staying well back from the water, using available cover, wearing green clothing to blend with the foliage.

Are there any flies coming into pool from riffles above? Are any trout rising in pool? Are there flashes in deep parts of pool as trout roll to side for food carried along by deep currents? All is quiet—?

We find a comfortable seat well above head of pool where there is clear view of entire pool. A mass of water squeezes between car-size boulders and tumbles into pool. Car-size boulders line shore down convex side of pool. Trees ring the pool, and shade most of it. Some long branches extend far out over convex shoreline, and almost sweep the water. Water currents hurry along convex shore and curl around edges of the large boulders. Some currents buffet and rise over submerged boulders. Other currents eddy to side into slack water along concave shoreline.

Brown trout often lie in front of submerged boulders, so they can easily rise and take food carried by currents. We watch closely for rises in front of boulders. Browns also have bad habit feeding under overhanging branches where it is impossible to cast. It is essential to determine exact location of a brown trout before casting. Random casts are useless and only disturb the pool. Casts across currents are also quite useless. There are two fairly good casts, directly upstream and downstream with at least twelve foot leader; but even these casts usually cause too much wading-casting disturbance.

Our favorite tactic for the big browns is fishing nymph-type lure downstream on long-fine leader. Our favorites are 16 Black Stone, 12 Brown Hackle and 10 March Brown Nymph. We stand inconspicuously at head of pool, flip lure out in fast water and allow current to pull line directly from dragless, clickless reel. With reel mounted on flyrod in reverse position, reel-handle is held very lightly between tips of index finger and thumb. The lure always has its HEAD UPSTREAM as natural nymphs do. If water temperature is below 55 degrees some lead is

attached to leader few feet above lure. This tactic was first used long ago when helping the youngsters snag their first trout.

Sometimes it is possible to move quietly-invisibly to position and take large browns by dapping lure on surface of water. Short length of four pound monofil line is used for dapping leader. When dapping, the leader is not allowed to touch water. We often stand in riffles below and dap lure up in tail of pool three or four feet upstream so lure is visible from hiding-feeding places back under edge of boulders.

Before time expires we fish head of pool by flipping lure into tumbling water and allowing it to explore depths of entire boiling-water area.

For solid recreation and husky brown trout it is hard to beat leisurely trips to a nearby pool.—Art Clark

★

*Now fades the last long streak of snow,
Now burgeons every maze of quick
About the flowering squares, and thick
By ashen roots the violets glow.*

—Tennyson

★

*Of recreation there is none
So free as fishing is alone;
All other pastimes do no less
Than mind and body both possess:
My hand alone my work can do,
So I can fish and study too.*

—Izaak Walton

★

*Like an army defeated
The snow hath retreated,
And now doth fare ill
On the top of the bare hill . . .*

—Wordsworth



ICE FISHING AT ERIE was so popular this winter the Fish Commission Maintenance crew was called out to plow snow-covered roads leading to access area approaches.



CLUB OFFICERS—Past President and newly elected financial secretary Joe Phillips, second from right, congratulates Leroy Gathers, newly elected president of the Western Reserve Fish and Game Protective Association. Left to right, Seth L. Myers, historian; Gladden Barnes, treasurer; Charles Templeton, vice president; Gathers; Phillips; and Gerald Boyes, secretary.



GUESTS AT WESTERN RESERVE DINNER—(l-r) Wallace C. Dean, president, Pennsylvania Fish Commission; John H. Grenoble, past president, Pennsylvania Fish Commission; Judge Leo H. McKay, Mercer County Court; Albert M. Day, executive director of the Pennsylvania Fish Commission, who was principal speaker; Basil Scott, member, Sharon City Council and Herbert L. Buchanan, vice president, Pennsylvania Game Commission.

Executive Director Praises Sportsmen

Fish Commission President Wallace C. Dean Honored

■ Sportsmen in the state should be proud of the accomplishments of the Pennsylvania Fish Commission, said Albert M. Day, executive director of the commission, at the 27th annual banquet of the Western Reserve Fish and Game Protective Association at Sharon.

Day not only discussed the accomplishments of the Fish Commission in the field of trout rearing and planting but also went into detail on water management problems in Pennsylvania and what the Commission is doing to solve the problems.

Concerning the fish situation, Day said, "We are stepping up our trout rearing and planting program this year considerably. We are trying to see that every one of our hatcheries gets into maximum production as soon as possible. We expect this year to have an additional 300,000 legal size trout to plant in Pennsylvania streams and lakes. We are continuing our program of acquisition of fishing lakes and improvements on them." Day pointed out that the commission recently signed a contract to buy the Walnut Creek access area, a few miles west of Erie to provide a launching site for boats and a site for capture of fish from Lake Erie to stock in inland waters.

Muskie Program

He said that one of the finest developments that has ever been made in the field of fishery management is the

muskie program in the northwest section of Pennsylvania, under the management of Wallace Dean of Meadville, president of the Pennsylvania Fish Commission.

Most of his speech was spent on the water management problems of the state. Day went into detail about the stream pollution problem which is being remedied by his agency.

"We here in Pennsylvania are now trying to restore the rivers to what they were before we destroyed them," he stated, "and Pennsylvania is to be congratulated on its hard-boiled attitude toward the management and control of its public waters."

One of the big controversies of the day is whether the fisherman is going to be driven into the coves and shallows to make more room for water skiers and speed boat enthusiasts. A serious conflict has developed in recent months between the "pleasure boat users" and the "fish boat users" over who shall dominate the common use of our common heritage.

Boating Laws

Day stressed that the Fish Commission has had the responsibility for administering the boating laws in the state since 1931 and has done an excellent job. He said that the commission has accelerated its program of administering the laws with a training program. Forty-seven separate sites have been acquired by the commission along public waters for the boating public.

The basic philosophy of the commission, Day stated, "is that a single agency can do a better job of dividing the

recreational opportunities of public waters than can two or more agencies."

The commission believes that with a few adjustments in the basic law which it has administered for 30 years, with an increase in revenue, and some re-alignment of emphasis in the administrative program, it can provide better service for fishermen, skin divers, speed boaters, water skiers and recreationists of all kinds.

Other Speakers

Day was introduced by Johnny Pepe, sports editor of The Sharon Herald, who served as toastmaster.

Remarks were heard from Wallace C. Dean, Meadville, president of the Pennsylvania Fish Commission. Special guests introduced by Pepe were John H. Grenoble, Carlisle, past president of the Fish Commission; Temple A. Reynolds, Franklin, supervisor of the Northwest Division of the Pennsylvania Game Commission; Bob Parlamen, Franklin, public relations officer of the Northwest Division; Art Biondi, Mercer, state game protector; Arden Fichtner, Greenville, state game protector; Herbert L. Buchanan, Franklin, vice president of the Pennsylvania Game Commission; Jim Brown, formerly public relations officer of the Northwest Division who is now division superintendent in South Central Division; C. Ed Palmer, Erie, state treasurer of the Pennsylvania Federation of Sportsmen's Clubs and president of the Northwest Division of the PFSC; Mr. and Mrs. S. Carlyle Sheldon, regional warden supervisor with headquarters at Conneautville; Mr. and Mrs. William E. Daugherty, fish manager, Conneautville; Mrs. Lois Macyko, Northwest Division secretary; Raymond Hoover, Crawford County fish warden; Mr. and Mrs. Clifton E. Iman, Butler and Beaver County fish warden.

Mr. and Mrs. Norman Ely, Erie County fish warden; Mr. and Mrs. Kenneth Corey, Warren County fish warden; Mr. and Mrs. Clarence Shearer, Venango and Eastern Crawford County fish warden; Mrs. Richard Abplanalp, wife of the Mercer County fish warden; Norman Blum, Forest and Clarion County fish warden; Shyrl Hood, superintendent of the state fish hatchery, Erie; and Alfred Larsen, fish biologist at the state fish hatchery, Erie. Abplanalp was hospitalized with pneumonia and was unable to attend.

Seth L. Myers presented a spinning reel gift to Day and a citation from Western Reserve to Dean.

Officers for 1961 are LeRoy Gathers, president; Charles Templeton, vice president; Edward Boyes, secretary; Joseph Phillips, financial secretary; Gladden Barnes, treasurer; and Myers historian. Directors are Richard Heck, archery; C. Paul Blair, conservation; Tom Horsman, Sr., farmer relations; Henry Gates, forestry; Arthur Daugherty, game; John Clune, fish; James Snyder, membership; Pepe, publicity; Wayne Ellis, public relations; Fred Roeding, rifle and pistol; Albert Bobby, skeet and trap; Richard Matters, sporting dogs; and Calvin Paugh, social welfare.

★

*The cock is crowing,
The stream is flowing,
The small birds twitter,
The lake doth glitter,
The green field sleeps in the sun . . .*
—Wordsworth



DISTRICT WARDEN PAUL ANTOLOSKY gives directives to Harry Bratton on "Operation Feet Freeze"



TWO CREWS helping to clear a mile of brush on Mountain Branch Run, Centre County, included: Vick Freeburg, Jr. Kasubick (who fell in the crick), Bob Sebolsky, James Love, Oley Olsen, Gerald Shaffer, Carl Broberg, Norman Broberg, John Blair, Harry Bratton, Frank Bryon, Don Oberheim, Pete Youstic, Bob Ross, Frank Waranovic, John Hancock, Protector, Pennsylvania Game Commission, Glenn Evans, Andy Harchak of the Pennsylvania State Police, Ed Warner, and Mike and Jerry Ybernetsky.

Operation . . "Feet Freeze"

About 30 men (and we do mean men) turned out for a brush clearing stream improvement project on Mountain Branch Run near Houtzdale, Centre County January 22. The day was stormy, blustery, 10-degrees below zero with a foot of snow on the ground and more falling. Jeeps, trucks and men repeatedly bogged down in the snow but the crews armed with donated chain saws and rigs handled by experienced woodcutters, managed to get the job done. One poor fellow slipped into the icy water but this was the only casualty. Within three hours over a mile of stream had been properly cut and cleared with deer browse made available.

District Fish Warden Paul Antolosky, Centre County was in charge of the project aided by crews from Pennsylvania Game Commission, Houtzdale Rod and Gun Club, Philipsburg Rod and Gun Club, Brisbin Sportsmen, Osceola Mills Gun Club, Altoona Sportsmen, Old Town Sportsmen, Nittany Timberlands, Warner Tree Company, Homelite Chain Saw Company.

★

Great Scott!

Mention of McKeesport reminds me of the years I spent there in the '30's. I was teaching English, and more specifically Scott's "Lady of the Lake" . . . five classes of it. Now it has always been my contention that conservation, like spelling, grammar, sentence structure and love of your fellow man should be taught constantly by all teachers . . . more or less subtly if possible . . . but constantly along with whatever subject you are paid to teach. So the sparkling lochs, the flashing streams, the Scottish forests to the water's edge were wonderful ways of bringing home the fact that our muddy Monongahela River was neither flashing nor sparkling nor tree-edged. We considered how it got that way and what possibly could be done about it.

There was a Superintendent of Schools at McKeesport in those days who was regarded by many pupils and teachers as somewhat less than a Simon Legree—but not much less. One day, I remember, the door opened and in he came. I was in the midst of a conservation sermon, and very shortly he left. He eased into my room four times that day, and each time he found me teaching English heavily saturated with conservation. The fourth time he advised me to step out into the hall.

I followed . . . quaking . . . expecting the very end of things. There was no teacher tenure then.

"You are supposed to be teaching "Lady of the Lake," he stated.

"Yes, Sir."

"And yet I have found you teaching conservation and natural resources?"

"Well, yes, I guess you could say that, sir."

There were a few moments of absolute silence as he studied my tie. He was short of stature.

Then he said solemnly, "I liked it."

My face must have given away my unbelievable relief, but if he was amused, he showed no sign except a grunt as he went his way.—*Carsten Ahrens*

★

If all of us interested in conservation do no more than we have to it will come to a standstill tomorrow.

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FISH WARDEN CITED—The Lehigh County Federation of Sportsmen's Clubs recently presented the above plaque to District Fish Warden Harvey D. Neff inscribed . . . "so that his fellow men may know that the Federation takes this means of expressing the appreciation of his courteous reasonable and humane approach to law enforcement as well as his faithful and unstinted efforts in the interest of Conservation." Warden Neff has recently returned from a hitch in the hospital and his many outdoor friends are rooting for his complete recovery.



Fish Commission's Maintenance Men Meet

Maintenance men of the Fish Commission's Real Estate Division met at Harrisburg recently to talk over problems in the maintenance areas of the Commission during 1960 and to plan for work of 1961.

The crews were from the Southwest area with headquarters at Somerset, Pa.; Northwest area, Corry Hatchery; Southeast, Huntsdale Hatchery and the Northeast area with headquarters at Pleasant Mount hatchery.

The crews maintain the properties of the Commission, keeping them in good condition, maintain buildings, repair and erect signs and assist in lowering water levels of lakes, etc.

A workshop equipped with modern power tools, is installed at the Pleasant Mount area for making signs and repairing equipment of all areas of maintenance. The crews are equipped with trucks, lifts, tractors, mowers, saws and sprayers. This equipment is used to maintain the many lakes and access areas developed by the Commission for the boating and fishing public.



RETIRED . . . John Muldowney, December 30 last. He was a Security Officer for the Pennsylvania Fish Commission since 1945 at the Pleasant Mount Hatchery. Mr. Muldowney was born in Simpson, Lackawanna county, Pa., was educated in Simpson and Scranton schools, worked for a number of years in the coal mining industry. He is married to the former Teresa Meagher and they now reside near Belmont Lake.

★

Fishery Workers Eye Lamprey

Many people who fished the Allegheny River last summer noticed a small eel-like fish attached to the breast of large suckers. Others noted a heavy mortality of suckers especially in the Warren County area, but they were not certain of the cause. Fishery workers have identified the culprit as the Ohio lamprey (*Icthyomyzon bdellium*) a small parasitic member of the lamprey family.

At present this lamprey is not affecting the sport fishing, but may be helping it by reducing the amount of rough fish present in these waters. However, the situation is being closely watched and studied in the event that game-fish become a major target of the parasite.—William Daugherty, Regional Fishery Manager.

★

MAINTENANCE MEN, Real Estate Division, Pennsylvania Fish Commission discuss problems in the field from every region of the state: (l-r) Clyde Buell, S.W.; Allan Shaffer, N.W.; Melvin Dinger, N.W.; Dan O'Neill, N.E.; George Moase, N.E.; Harry Johnson, S.E.; Don Heinbaugh, S.E.; Kenneth Rininger, S.W. and Ralph Blessing of the Harrisburg Office.





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Fourth Month

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hath 30 days

in the year {1961

Wind
from the South
blows the bait
in fish's
mouth



Wind
from the East-
the catchings
least

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
 Full Moon 1 st & 30 th	 Last Quarter 8 th	 New Moon 15 th	 First Quarter 22 nd	POOR ANGLER'S ALMANAC		ALL FOOL'S DAY AM
EASTER AM	 AM	 PM	 PM	 PM	 PM	 AM
 AM	 AM	 AM	 AM	Thomas Jefferson 1743 PM	 PM	TROUT SEASON ★ BEGINS ★ PM
 AM	 AM	 AM	Revolutionary War began 1775 PM	 PM	Spanish-American War began 1898 PM	 AM
 AM	1 st U.S. Newspaper Published 1704 AM	 AM	 AM	 PM	 PM	 PM
 PM	Ye Olde Legend Denotes BEST days GOOD days FAIR POOR AM/PM Indicates best time of day - subject to change by local conditions					

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TROUT *and* TROUT HATCHERIES *of the* FUTURE

By

Keen Buss

Fishery Biologist

Benner Spring Fish Research Station, Pennsylvania Fish Commission

Photos by Johnny Nicklas—Chief Photographer

ABSTRACT

Possible and probable methods for improvement of fish hatchery management and production of trout are presented. It is concluded that in the future application of known information and further research will result in more efficient and more mechanized fish rearing and distribution; in better diets and feeding methods; in improvements in disease control; and in development of improved strains of fish. The literature on these topics is reviewed.

INTRODUCTION

★ There is reason for disagreement when anyone discusses what will occur in the future. However, that there is room for improvement and that there will be improvement in trout and trout hatcheries of the future cannot be denied. Economy is the mother of improvement in fish culture. If fish culture, and particularly trout culture, is to continue to be a tool of fishery management more economical methods must be found.

Labor, fish food, maintenance and operation are the major costs of fish culture (Haskell, 1952). Industry and agriculture have given us a clue as to how to increase and improve the product at a lower cost. The competitive nature of industry has helped to speed up research and automation in almost every aspect of manufacturing. Likewise, mechanization, better nutrition, and improvement of breeding stock are responsible for the phenomenal advancement of agriculture.

During the first forty years of this century, fish culture did not keep pace with industry and agriculture. This is due to many things such as administrative politics, lack of competition and therefore a loss of incentive, insufficient biological information concerning methods of management, the pressure for maximum production, and among others, the lack of research funds and facilities.

During the last twenty years, and particularly in the last ten years, all branches of fishery science have attempted to duplicate the advances of industry and agriculture through research by borrowing freely from these sciences. In basic research lie the clues as to how the trout hatchery of the future can be made an economical tool of fishery management. The opinions in this paper, and they are opinions, are based on the past findings in fishery science and other related fields, and also, the author's personal experiences in research at the Benner Spring Fish Research Station at Bellefonte, Pennsylvania.

New type concrete trough and water supply unit for starting fingerling trout



An automatic fish feeder



HATCHERY CONSTRUCTION

One of the determining factors in cost of rearing fish is the construction of hatcheries. More complete utilization can be obtained from a long raceway since there are less screens to clean, water flow is uniform without dead areas, and one man can feed more trout. At the Benner Spring Fish Research Station (Buss, *et al.*, 1953), twenty-three tons of trout were raised in one season in a raceway 0.55 of a mile in length. One man fed and cared for these fish. This dirt raceway was not cleaned until it was drained and the fish removed. Whether there is more bacterial decomposition in dirt raceways than concrete raceways is only conjecture, but at the time of draining very little undecomposed organic matter was found. Dirt raceways are of simpler construction and easier to build. Also, raceways will be more efficient to mechanize than ponds.

At present, few hatchery buildings utilize more than about 8 to 10 inches of the available vertical space. This is the depths of the troughs now being used. The growing trend, of course, is to make use of the additional space. Vertical egg incubators (Lindroth, 1956; Burrows and Palmer, 1955) and the jar culture of trout eggs (Buss 1959a, 1959b), along with the use of better fungicides, will not only utilize much of the vertical space in a hatchery but will also eliminate most of the egg picking.

Vertical space can also be used for the rearing of fry and fingerlings and this will mean that more young trout can be held in the building until the spring shipments provide space outdoors. The use of fifty-five gallon drums for fry rearing is now being tested at Benner Spring. They are modified and function on the same principle as the warm water hatching jar—the water being fed through a pipe to the bottom of the drum which allows even water dispersal among the fish. The water spills out at the top. Success of this experiment would mean that the holding capacity of the building would be increased six times. Thus, the hatchery building of the future may be smaller but the space will be used more efficiently and heating and maintenance costs will be lowered.

MECHANIZATION OF HATCHERY PROCEDURES

One of the greatest lags in trout culture is in the field of automation and improved hatchery techniques. Why this lag should exist is not fully understandable. Kingsbury (1951) and Haskell (1952) recorded that over forty per cent of the total fish cultural budget is consumed by personal service. This undoubtedly used the major portions of the money allotted, yet as Haskell (1952) noted, the labor costs have, in general, been considered much less carefully than the economics of fish food.

Automation and improved hatchery techniques will undoubtedly save much of the cost of labor in fish culture.

Time-consuming seasonal tasks should generally lend themselves very easily to mechanization and streamlining. In many instances the basic principles have been worked out; but modifications are needed. In other instances, many mechanical features have been adopted by individual hatcheries or states, but have not found widespread use.

Below are listed some of the labor consuming chores which have been subject to mechanization, or will be, in trout hatcheries of the future.

Screen cleaning and automatic water regulations

Cleaning screens and adjusting water flows are important to the survival of the fish and necessitate constant attention. Self-cleaning screens and automatic water gates (Whalls, *et al.*, 1956) would eliminate much of these tasks.

Feeding

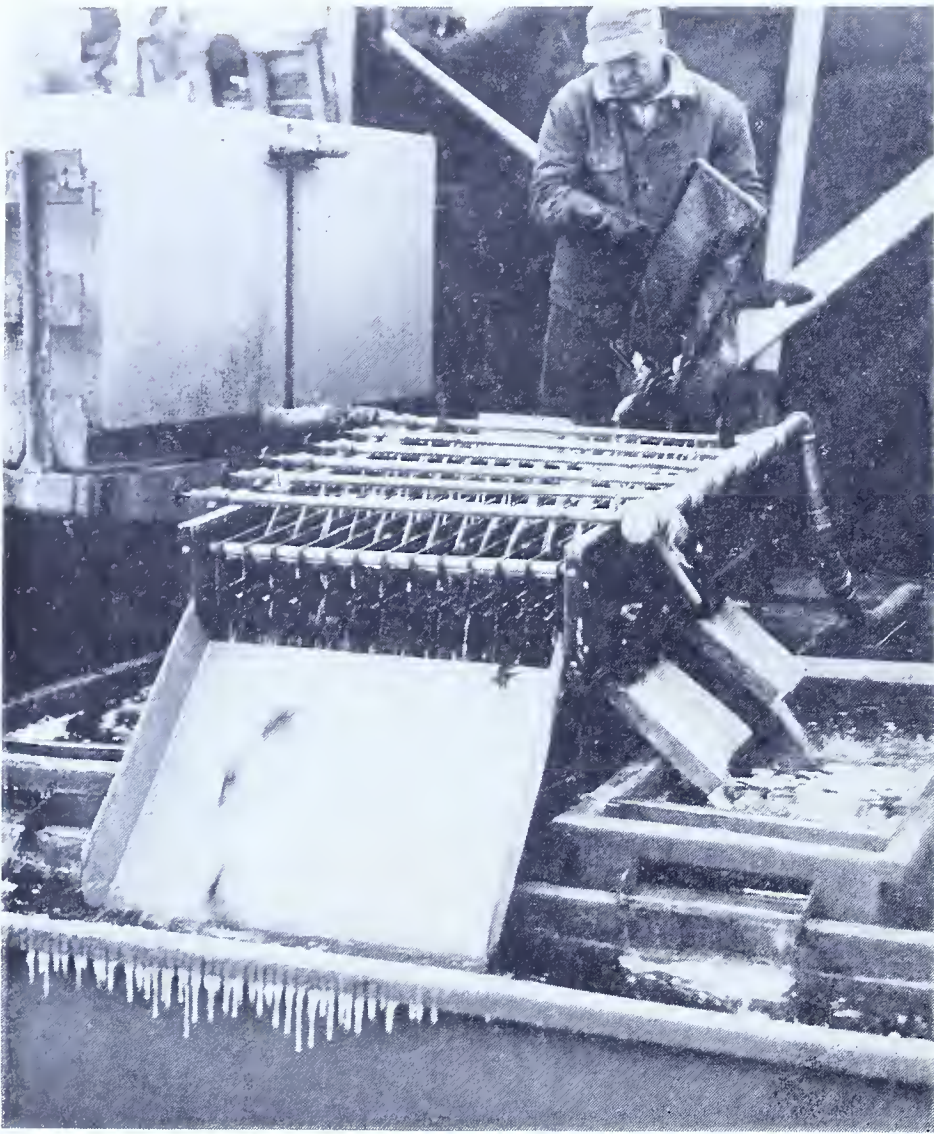
Pellets lend themselves very well to mechanical feeders. Not only will the feeders save time and money, but by using a timing attachment, fish can be fed over a long period and at more frequent intervals than is customary with hand feeding. They can also be fed in the early morning and late evening during the hot summer months when trout naturally feed the best. Twenty-four hour feeding during summer may prove of value.

Fish collecting

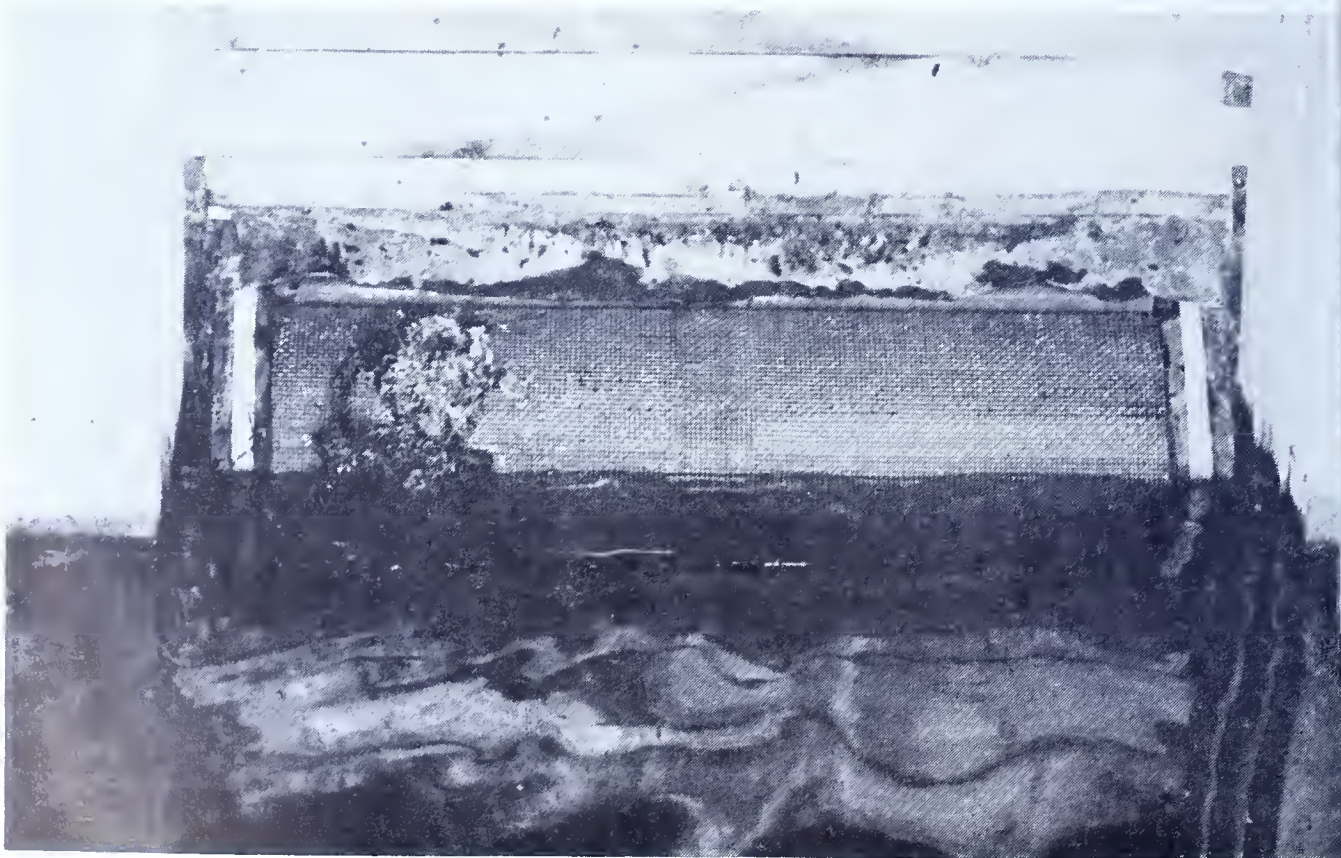
Collecting fish with seines from hatchery ponds and raceways requires substantial manpower and repetition. Efficient electro-methods of fish collection will not only be a boon to fish culture but to management as well. These could very well be developed in hatcheries. Work by Lennon and Parker (1955) and many others have laid the groundwork for a more efficient unit. Based on the preliminary results of work now in progress by the Fish and Wildlife Service, it is reasonable to predict that hatchery fish will not only be collected from weed-choked ponds and raceways, but also will be subject to selection. For example, it has been demonstrated that pulsed DC current of various wave shapes and frequencies have selective effects on different species of fish and on different size ranges of a given species. It is obvious what the electro-method of fishing will mean to fish culturists when it is fully developed.

Weed control

Control of algae and of higher aquatic plants is a perennial problem. At present, it is difficult to control plants in running water because of the contact time necessary. Species-specific herbicides like those developed for terrestrial plants may very well find application in an aquatic environment. Pelleted herbicides giving controlled rates of dissolution may be the answer in running water.



Mechanical fish grader



A rotary self-cleaning screen

General maintenance

Use of a tractor and attachments will speed up general maintenance chores. At present at the Benner Spring Fish Research Station, the grass is mowed on bank tops with a mat hammer mower. Low banks are cut with a highway sickle-bar mower which will cut at a 45 degree angle. The tractor is also used to pull a transportation unit which can be used as a herbicide sprayer with constant mixing of the chemical through the recirculating unit. The highlift unit is used with modification to lift the mowed weeds from raceways. Undoubtedly many other hatchery chores can be accomplished with a small tractor and the many attachments available.

Transportation units

Most transportation units use either a recirculating system or bottled oxygen. Haskell's (1958) preliminary results have shown that a combination of oxygen and recirculation is more effective. In this manner the oxygen supply is at a maximum and carbon dioxide is removed in the recirculation unit. Refrigeration units or the use of drugs on the transportation unit lowers the metabolism of fish and permits a larger number to be transported (Schultz, 1956). Lightweight metals such as aluminum and lightweight insulation such as styrofoam are known to form a compact unit. It is conceivable that hatcheries with long hauls on good roads will go to a trailer-type unit similar to the large milk transports. This will save drivers, time and many areas can be planted on one trip.

Counting, grading, weighing and loading

Counting, grading, weighing and loading are combined in this discussion because in the future it will probably be one operation. Electronic counters (Anon., 1957), parallel bar graders (Morton, 1956), weighing by water displacement, and conveyors (Leitritz and Macklin, 1956) have all been developed. All that remains is to modify these procedures and combine them into a working unit and these four tasks will be a simplified one-operation chore.

Spawning

In larger hatcheries, mechanical spawning devices will be used. Lindroth (1956) describes a salmon stripper which utilizes water pressure to extrude the eggs. Air pressure and possibly even electricity may be adapted to spawn fish. Electro-stimulation is now being used to collect semen from farm animals (Barker, 1958). The hatchery building of the future may have a spawning "parlor" much like the milking parlor of the large dairies. It is conceivable that one man could spawn four or five females at one time with push-button effort.

DIETS

It has been pointed out by Phillips, *et al.*, (1957) that after years of study, rations for domesticated animals are considered superior to the natural food of these animals, and it is reasonable to expect that as research progresses the food fed to trout in hatcheries will be superior in all respects to natural food.

What in general can be expected of this new food? It will be a complete dry diet either in the form of meals, crumbles or pellets which will be efficient in all types of water and geographic locations. The meat fraction of the diet will be eliminated. The growth and general well-being of the fish will be as good or better than the wild fish just as it is with fowl and other farm animals. Conversions of food to fish flesh will be low. Based on a pilot study at Benner Spring, the food cost of raising one pound of trout may be below 15 cents at present cost standards.

Also included in the pellets will be a colorant which will develop the natural or wild color of the species. Studies by Tunison, *et al.*, 1942, have shown that many ingredients will bring out the natural colors of trout. More recent studies at Benner Spring (Buss, 1958) have added other components to this list. Some colorants will produce high colors in trout in less than three weeks.

Brook trout at Benner Spring fed a 100 per cent shrimp diet over a seven month period before spawning produced a higher percentage of viable eggs than those fed the regular hatchery diets of meat and fish or meat and pellets although growth on this diet was poor. It is probable that the ingredients which were responsible for this higher egg viability will be isolated and included in more complete diets.

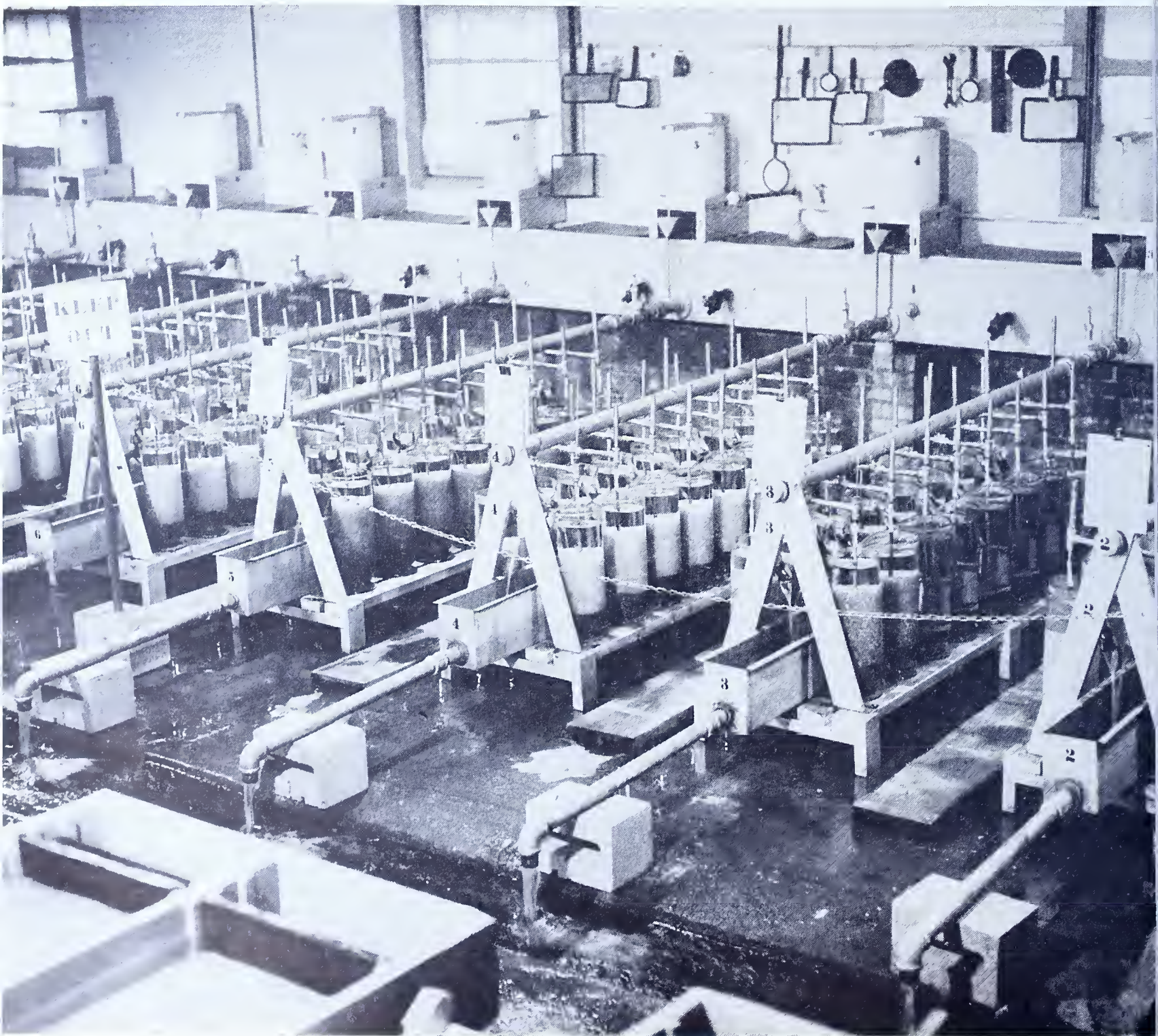
Pellets of the future may be mechanically tailored for the type of water area being fed—floating pellets for some areas such as very long raceways, slowly sinking pellets for ponds and short raceways, or heavier pellets for small confined areas.

TROUT DISEASES

Although trout diseases have had more study than those of other fish species, much more can be accomplished with intensified research. The important contributions of the late Dr. H. S. Davis, Dr. Snieszko at Leetown, West Virginia, Dr. Rucker at Seattle, Washington, and others exemplify what accomplishments could be obtained with a concentrated effort. It is necessary to apply the principles now being utilized for men and higher animals such as clinical pathology, including serology, histopathology and other modern diagnostic measures. When these techniques are applied to trout, tools will be available to diagnose and develop treatment for most diseases.

In the future, the prevention of bacterial and virus diseases will be extended with more research on disease re-

Jar culture of trout eggs



sistant strains (Wolf, 1953, use of prophylactic drugs and antibiotics; Snieszko and Bullock, 1957), and possibly the use of various immunization techniques.

In the past, fish pathology has not always had the benefit of immediate adoption of the newest techniques of human and veterinary medicine. Today, many universities are recognizing that fish are ideal organisms to study, and in the future, coordinated efforts may make fish pathology a field of intensified research and a leader instead of a follower.

SELECTIVE BREEDING OF TROUT

Wood (1953) reviewed a century of fish culture and stated that work in the field of fish genetics has never received the attention which it appears to merit. This sums up the situation in trout culture. Everything else being equal, a hatchery is only as good as the strain of trout it produces and rears. Working with a poor strain of trout is analogous to a rancher trying to compete on the beef market by rearing longhorns. The economic outcome is predictable and obvious. Strains of trout must be developed with disease resistance, fast growth, high egg number and viability, vigor, good appearance, high palatability, and the ability to survive under natural conditions. They must also be adaptable to the hatchery at which they are confined.

How can this be accomplished? Again reference can be made to agriculture (Hayes, *et al.*, 1955 and Lush, 1943). The work of these men indicates that one of the most successful methods of breeding in cross-fertilized species has been the combination of inbred lines which have been carefully selected and tested. Refinements within this intraspecific hybridization procedure include top crosses (selected inbred strains crossed to non-inbred strains), three-way crosses (hybrids of two inbreds crossed with a third inbred) and four-way crosses (hybrids of two inbreds crossed with hybrids of two others). Quite detailed procedures for improving existing inbred lines are now being used. These include convergent improvement and reciprocal recurrent selection which are designed to incorporate into each inbred line outstanding traits from the other. It is not generally agreed in agriculture which method is most effective, but all have proven themselves in one field or another. It remains for research in fish culture to prove the best method for trout.

Donaldson (1955) has shown that hybrid vigor results from certain intraspecific crosses. Survival of these hybrids exceeded that of the parent species when planted. This is an indication of what can be done with intraspecific hybrids for other characteristics.

On the horizon is an entirely new field for exploitation—immunogenetics. It is generally agreed that there is a one to one relationship between genes and antigens. Therefore, the detection of antigens provides a useful tool for the study of genes. In the erythrocytes of cattle, 40 distinct

antigenic factors have been found. Therefore the different combinations of these antigenic factors which might occur runs into the trillions. The possibilities of this technique is limitless for practical genetic application in breeding (Carpenter, 1956).

Comparative fertility and livability have been found to be directly related to blood factors in poultry (Briles, *et al.*, 1957). As the research proceeds, more and more characters will be related to blood types, and by use of blood factors, the performance and characteristics of the progeny will be predictable before crosses are made.

It is highly possible that this technique can be adapted to trout culture for such traits as disease resistance, growth, viability, etc. Isoagglutinations in fish are being studied by Cushing and Dural (1957) and others. Variations in antigenic factors are being established in fish of the same species similar to blood groups in humans. The study of immunogenetics in trout involves long-term research but by acquiring established blood types from breeders in poultry, cattle and elsewhere, this process may be speeded up.

The development through selective breeding of fish with one or more missing fins would provide a simple method of identifying trout—even at an early age. At Benner Spring, crosses of fish with missing fins have shown this character to be of a quantitative nature. The development of true breeding strains will require time.

The development of rainbow and brown trout which mature at two years of age and which produce large, viable eggs may be a method of reducing the cost of maintaining brood trout. Selected individuals have shown possibilities with this approach.

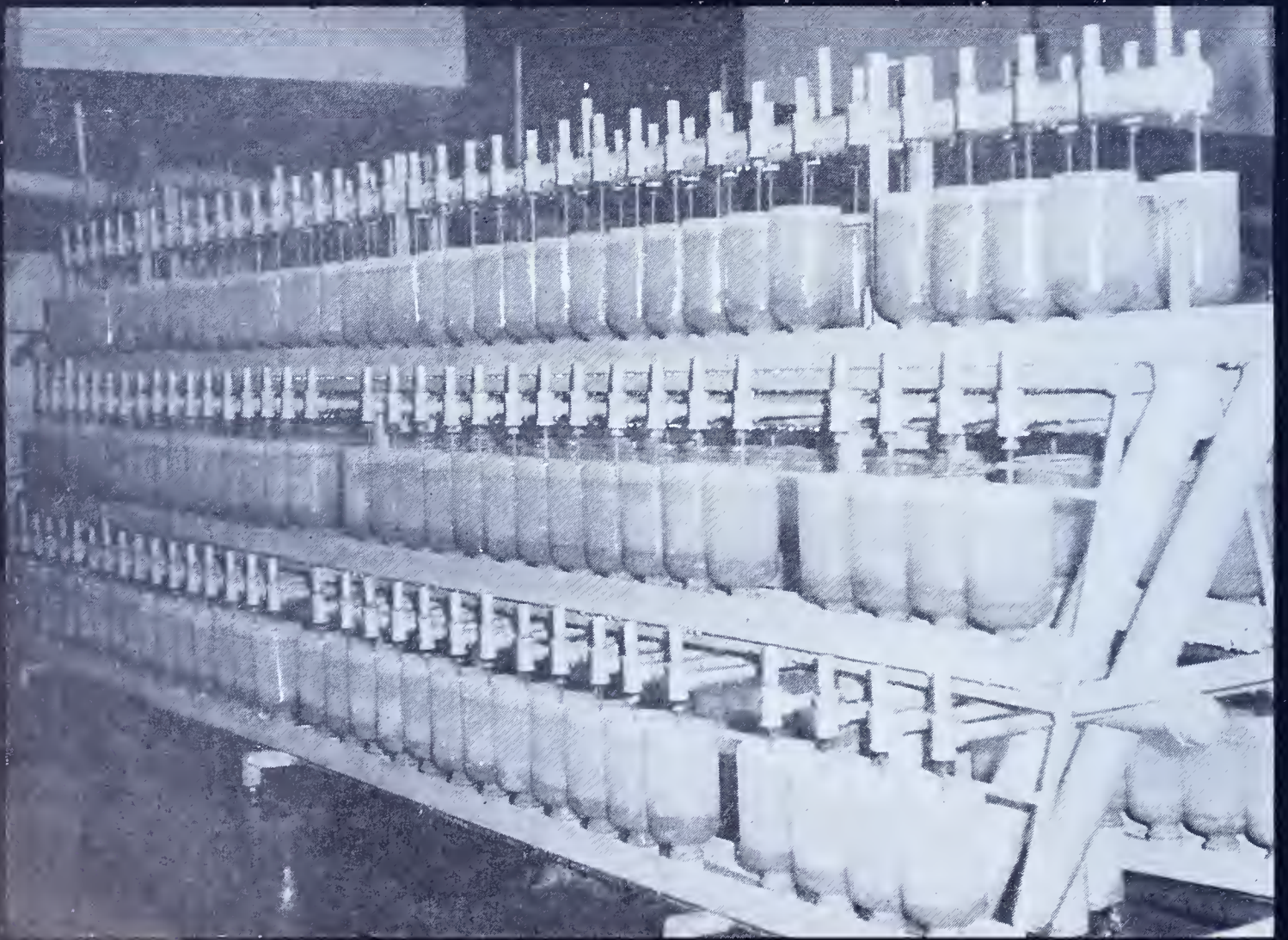
Exposure of trout eggs to radioactivity may produce a desirable mutation. However, the odds are very high against this occurring.

It can be gathered from this discussion that the field of genetics is unlimited in fish culture. It is also obvious that more research is needed. In the future, it is hoped that more states will turn their attention to the genetical aspects of trout breeding.

HYBRID TROUT

When experiments were first initiated with interspecific hybrid crosses, it was felt that backcrossing the F_1 progeny would offer a means to speed up the advances in selective breeding. Unfortunately, in most cases, there is a sterility barrier (Buss and Wright, 1956). Only the "splake" (lake trout X brook trout) and a few rainbow X brook trout (Buss and Wright, 1958) have shown any degree of fertility. For fishery management purposes, the splake does have some qualities not possessed by either lake trout or brook trout. Probably the most important are that splake can be caught more readily than lake trout, and that the splake ultimately grows larger than brook trout. One splake, held at Benner Spring, in its sixth year of life

Research of today, conducted in newly designed units
such as this will provide the trout of the future.



measured 27 inches and weighed 9 pounds. If the few fertile rainbow X brook trout could be successfully backcrossed to the brook trout, it would be a method of transferring the furunculosis resistance of the rainbow trout into the brook trout. Results of backcrosses of splake to brook trout show that backcrosses can be made and traits transferred without losing the identity of the backcross species. This is an example of what could be accomplished if fertile F₁ progeny of interspecific hybrids are found.

RESEARCH STATIONS FOR FISH CULTURE

Because of the pressure for maximum production, it is impossible to accomplish the needed research at the average state, federal or private hatchery. Fish culture research stations not only afford the research implied by the name, but are also excellent places to institute basic research on many fish management problems because of the confined environments which are available. Also, biologists with laboratory facilities could do many fundamental or academic research problems because of the unlimited sizes and number of fish available. Thus fish culture research stations have a multi-purpose program which will help to make fish culture and fish culture research an economical tool of fishery management.

CONCLUSIONS

Although the subject of trout and trout hatcheries was only touched upon in this paper, it is obvious that intense research in trout culture is greatly needed. As long as there is a demand for trout stocking, and there probably will be for a long time in one form or another, then it should be made as efficient an operation as possible. As stated in this paper, the groundwork for developing greater efficiency in fish cultural practices has been laid either by fishery men or workers in related fields. All that is necessary now is a coordinated research plan between the federal and state organizations. This could be patterned after the Federal Agricultural Research Program. The recent advances in agriculture have come about as a result of attacking problems on a regional and inter-regional basis through this program. A similar arrangement in fisheries with the U. S. Fish and Wildlife Service providing the impetus and coordination would be expected to bring about significant progress. Trout and trout hatcheries of the future, as speculated upon in this paper, would then be a reality in the very near future.

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The Age and Growth of the

MUSKELLUNGE

in Pennsylvania

PART VII

KEEN BUSS and JACK MILLER
Fishery Biologists
Benner Spring Fish Research Station
Pennsylvania Fish Commission

■ The muskellunge, the barracuda of fresh water, may be one moment lying doeilely under a patch of lilies or a sunken log, the next moment he may be a vicious predator, killing and eating any fish which strays near his lair. The killer instinct is the important quality which makes the muskellunge an essential part of his watery environment. Only the muskellunge grow large enough to catch and eat some of the large coarse fish such as suckers and carp. Becaause of their faster growth, they more quickly become capable of catching these larger coarse fish which tend to over-populate the waters. In small environments such as farm ponds, they would literally eat themselves out of food and home, but in larger lakes such as Conneaut Lake they aid in keeping the lake in balance. Of course, they have helpers in this lake such as northern pike, gar, walleye and bass. The fast producing fish species are held in check by these five predators and consequently one of the best balanced fish populations in the state is found in Conneaut Lake.

How fast is this fast growth? Look at Table I. In three years, on the average, a muskellunge will reach 24.5 inches. That's faster than any other species in Pennsylvania. Between four and five years of age they reach the legal limit of thirty inches. The females, at four years of age, are usually about six inches longer than a male of the same age. The females usually spawn for the first time at four years of age or about thirty inches.

Some of the fish from which data were derived in Table I were knownage fish. That is, fish were marked by fin-clipping the first year of life and as a result their age was known when they were eaught. This knowledge aided in the age determination of unmarked fish.

The length-weight relationship from 143 muskellunge records on file at Benner Spring are shown on Table II. It is quite obvious that the range of weights for each length group is extremely variable and there is little room for "rule-of-thumb" guess.

TABLE II
Length-Weight Relationship of 143 Muskellunge
from Pennsylvania Waters

Number of Specimens	Length (Inches)	Average Weight (Pounds)	Range-Weight
2	20.0-21.9	2.1	2.0- 2.1
2	22.0-23.9	3.5	2.5- 4.5
6	24.0-25.9	3.3	1.8- 4.1
11	26.0-27.9	4.5	3.6- 6.0
14	28.0-29.9	5.7	4.7- 6.4
23	30.0-31.9	6.8	5.3- 8.6
14	32.0-33.9	9.6	7.5-14.4
9	34.0-35.9	11.0	9.5-12.8
13	36.0-37.9	13.4	10.0-16.5
11	38.0-39.9	15.3	10.0-20.8
16	40.0-41.9	19.2	14.0-22.2
7	42.0-43.9	20.3	17.0-27.0
2	44.0-45.9	24.5	17.0-27.0
6	46.0-47.9	24.6	24.0-25.0
4	48.0-49.9	29.5	20.0-32.0
2	50.0-51.9	35.0	32.0-38.0
1	52.0-53.9	35.0	36.0

If you have to put a musky back because he isn't of legal size, don't feel disappointed. This so-called tiger of the fresh water will continue to eat and grow to improve your fishing.



THE muskellunge.

— Photos by —
Johnny Nicklas
Chief Photographer
Penna. Fish Commission



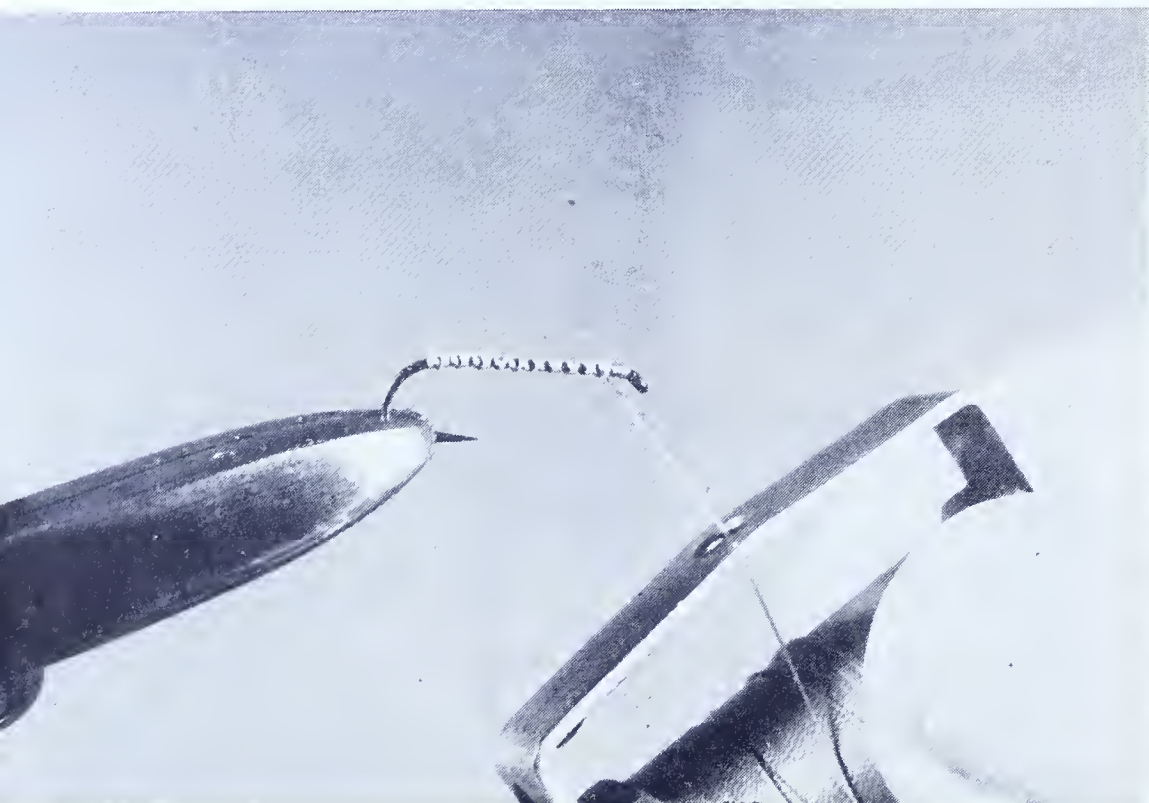
JUST A small musky, but he'll grow quickly after being returned to the water.

TABLE I
Average Calculated Total Lengths of Muskellunge at
Each Annulus in Pennsylvania Waters

Water	County	Number of Specimens	YEAR CLASS														
			I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
**Canadohta Lake	Crawford	44	7.3	15.6	23.8	29.3	33.3	37.0									
*LeBoeuf Lake Erie		25	7.5	17.3	24.8	30.6	35.5	39.9	43.4	46.6							
*Conneaut Lake	Crawford	19	6.7	15.0	21.5	27.0	31.1	34.7	37.7	40.5	44.6	45.8	47.2	48.6	50.4	52.6	54.0
***Pymatuning Reservoir		15	7.9	19.1	26.5	31.2	35.2	37.7	39.6								
***Black Moshannon Dam	Centre	13	9.9	18.9	25.6	29.7											
*Presque Isle Bay		7	9.1	18.7	25.8	30.4	34.6	37.4	39.9								
*Rivers and Streams	Erie	18	6.7	15.3	22.3	27.6	31.5	38.1	42.9	45.9							
*Miscellaneous Lakes		11	7.2	17.3	25.4	31.7	35.9	39.0	41.5	40.8							
Total Specimens		152															
State Average			7.8	17.2	24.5	29.7	33.9	37.7	40.8	43.5	44.6	45.8	47.2	48.6	50.4	52.6	54.0

* Based on anglers' catches—total length taken by anglers and wardens.
** All fish taken in spawning season in nets.
*** New introduction.

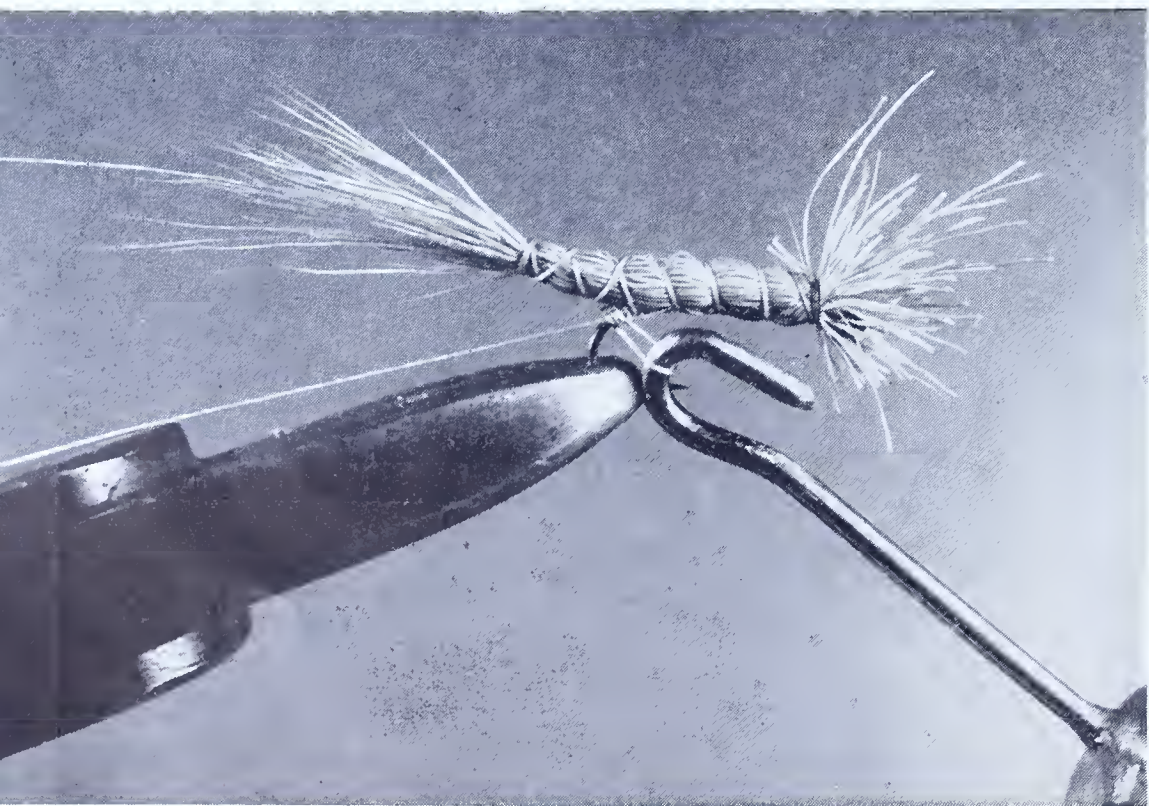
the INCH WORM



1. Prepare hook with waxed tying silk.



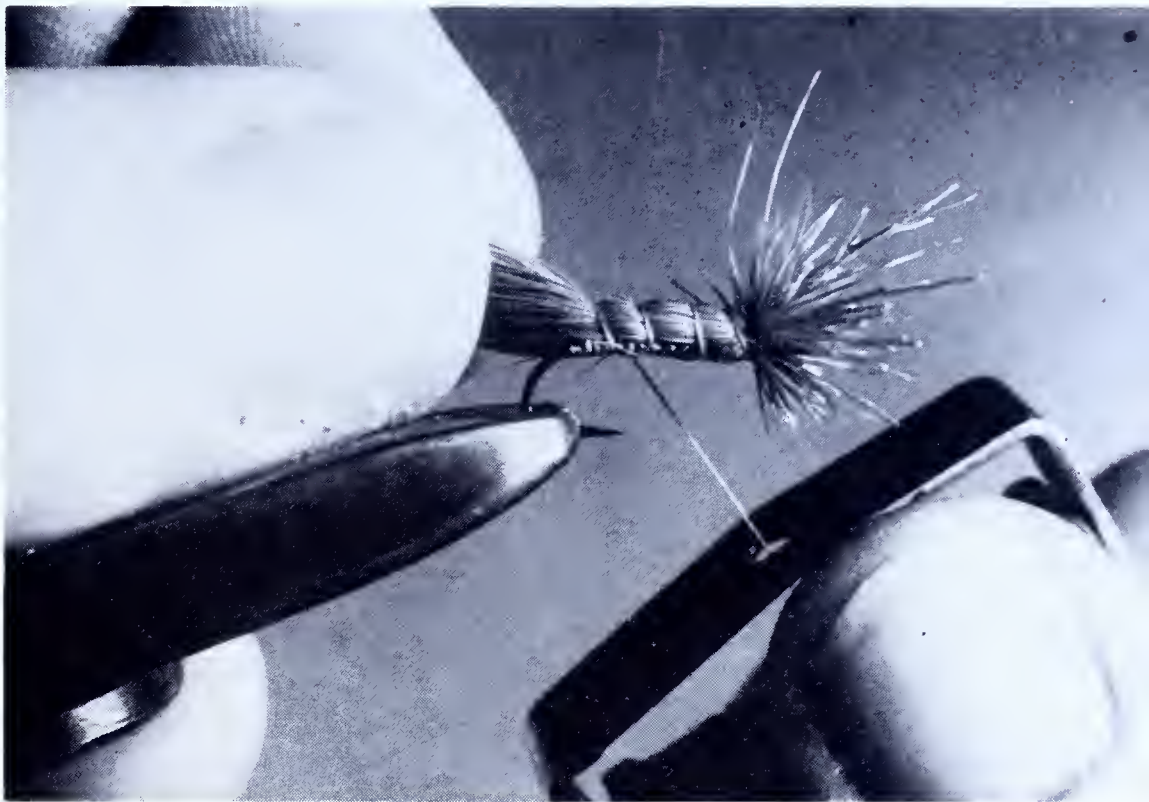
2. A tuft of dyed green deer hair, about the thickness of a pencil, is clipped from hide.



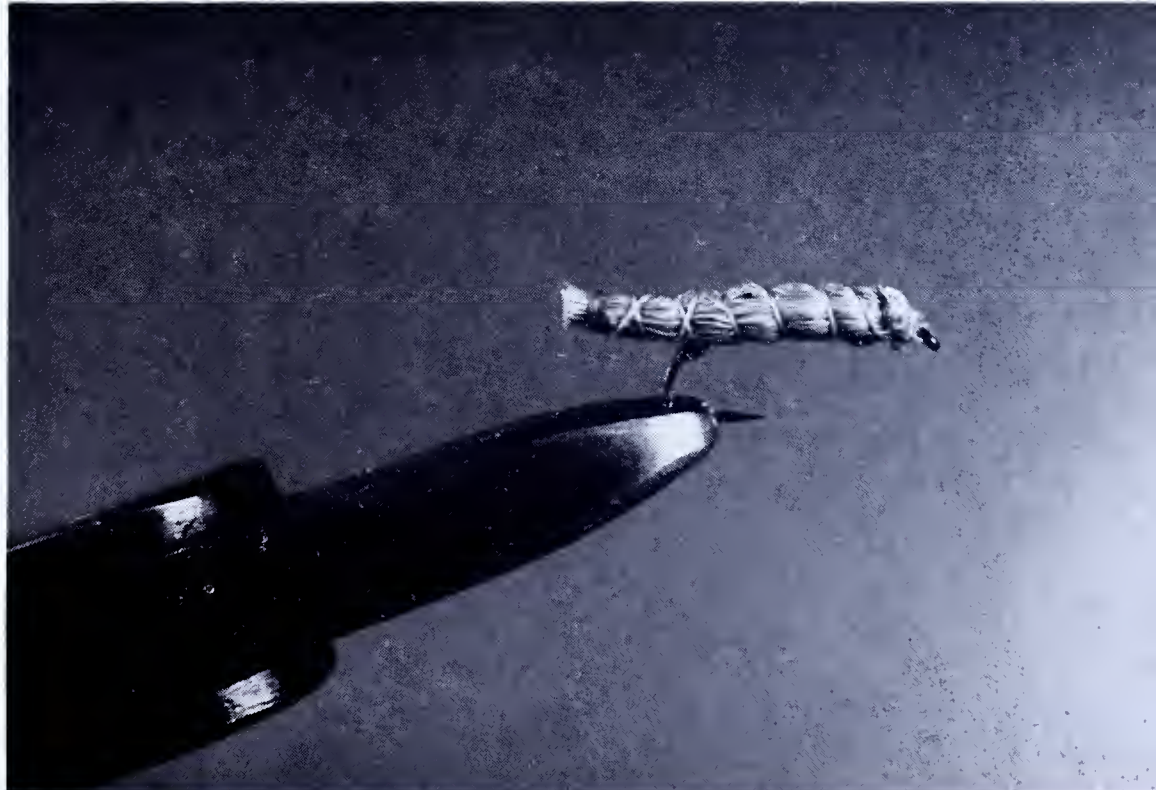
4. A short extension of the body is carried beyond hook's bend and thread is spiralled forward to bend where tie-off is made.



5. Trim excess hair at rear and at head.



3. Hair is tied in, butts forward at the head and thread is spiralled tightly around hair, working to the rear.



6. A touch of lacquer at tie-off completes Inch Worm.

(More on next page)

Taking 'Em on Nymphs

■ Versatile flies? Brother you said it. Nymphs can be fished upstream, across stream, downstream, on the bottom or on the surface. They'll take fish from one end of the season to the other, and in the middle too. Put on a big one and you have a perfect night fishing fly. Only one thing nymphs won't do and that is take trout in streams where there aren't any trout, I wouldn't be surprised if they took trout there too.

The most used nymph cast is straight upstream or up and across stream. I would venture to say that this cast is the work-horse of the good nymph, and the one requiring the most practice. Beginning nymphers should use short casts. That way you have complete control of your fly, and the telltale twitch of the line or leader when a fish takes it is more noticeable. The best way to be soured on nymph fishing is to start by using medium or long casts when you don't know just what to look for as sign of a strike. Ninety-five per cent of my casts are short to medium casts, and these are the real killers.

Day in, day out, short casts, especially on the average Eastern streams, will take more fish than the best executed long casts. Of course, you can't barge right up to a trout and expect him to hold still while you short cast him into submission. It has been done, but surely can't be recommended if you want to consistently take trout.

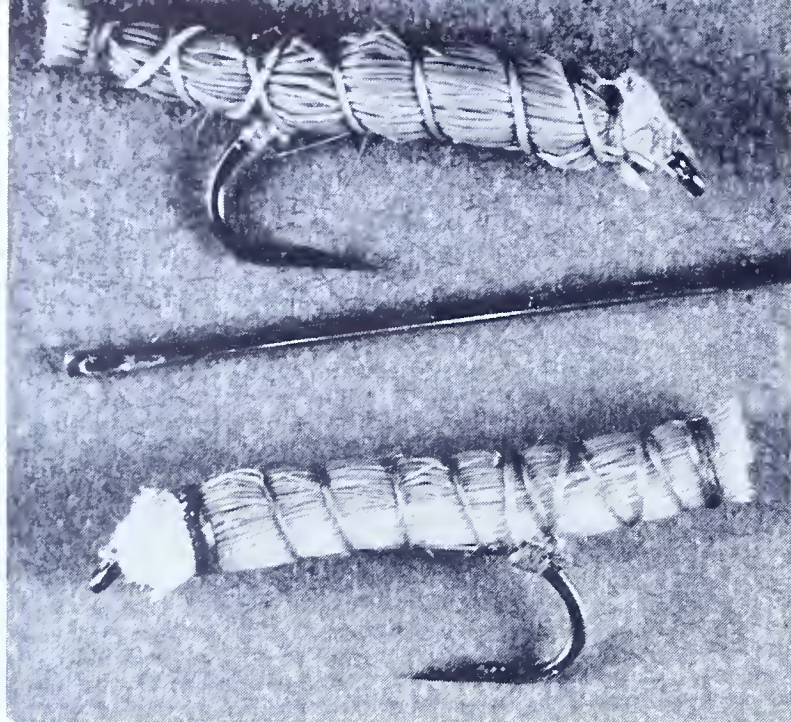
Try to select a position from which to make your short casts so you can cover the spot where you judge a fish to be lying. Walk (or crawl) slowly when moving into position, and wearing neutral-colored clothes is an added advantage. I prefer green clothing when fishing and at times feel that just the presence of a shiny face is enough to spook the fish. The art of fish stalking, approach, and position is an article in itself, so I'll stick more to the fundamentals of nymph fishing.

After you've made your cast, the idea is to set the hook as soon as the line pauses or gives an indication that something has stopped the nymph in its drift. Could be the hook bumped a rock, a log, some moss, or, a trout. Sometimes, when a trout takes, the line will give a very noticeable twitch. Other times the line will hesitate so slightly it will be barely noticeable. At, any rate, strike, you'll be surprised how many times the pause was caused by a taking trout. After a short time at nymph fishing you'll be keyed to strike quickly, sometimes only because an inner sense tells you to strike. And, you start catching trout. It's as simple as that.

The catchiest of the methods, in my opinion, is fishing the nymph on or very close to the stream bottom. When depth of water or flow of current dictates extra weight to enable the fly to reach bottom I prefer a tiny bit of strip lead on my leader about 14 inches above the nymph rather than weighting the nymph itself. If the water I'm fishing averages over six feet deep I use a sinking fly line of dacron, but generally prefer to have my line near the surface.

Such is the case when fishing the upper reaches of Pennsylvania's Yellow Breeches Creek near Carlisle. This part of the Breeches is small containing a succession of pools, shallow and deep riffles, overhanging banks and bushes, in fact, ideal water for nymph fishing.

For a good part of the season these trout are waded over



INCH WORM (completed)

■ Traditionally the connotation of "dry fly" has meant, with few exceptions, a floating imitation of the mayfly. Although this narrow concept is slowly being broadened by the fly fishing gentry to include other floating imitations, still the great majority of the dry flies found in the average fly box are conventional dries. This is understandable since the mayfly imitations are pleasant to use and are generally effective when the mayflies are on the water. Besides, "matching the hatch" when the duns are coming off or the spinners falling is the classical picture of trout fishing. The trouble is, over the entire course of the season on many trout streams, surface activity to the mayfly comprises only a part of the total dry fly potential. The void is filled by other forms of surface food which are generally prevalent and which are equally important to the trout and to the dry fly fisherman. Among the neglected floaters are imitations of the various caterpillars and particularly the green Inch Worm.

The little Inch Worm, or Measuring Worm as he is sometimes called, is well-known to the trout fisherman who fishes the woodland streams in May and June. It is a familiar sight to see him suspended by his single strand of web, barely touching the water near the edge of the stream. The trout are aware of him, too, and make the most of his appearance, often in preference to the mayflies then on the water. A good imitation of the natural is in order at a time like this and usually a hackled conventional dry fly won't do.

My favorite imitation of the Inch Worm is a pattern that requires a minimum of materials and tools and is surprisingly easy to make. When tied correctly it is virtually impossible to sink the Inch Worm, even in the heaviest water, but more importantly it has proven highly successful during the four years since its baptism. The dressing is as follows:

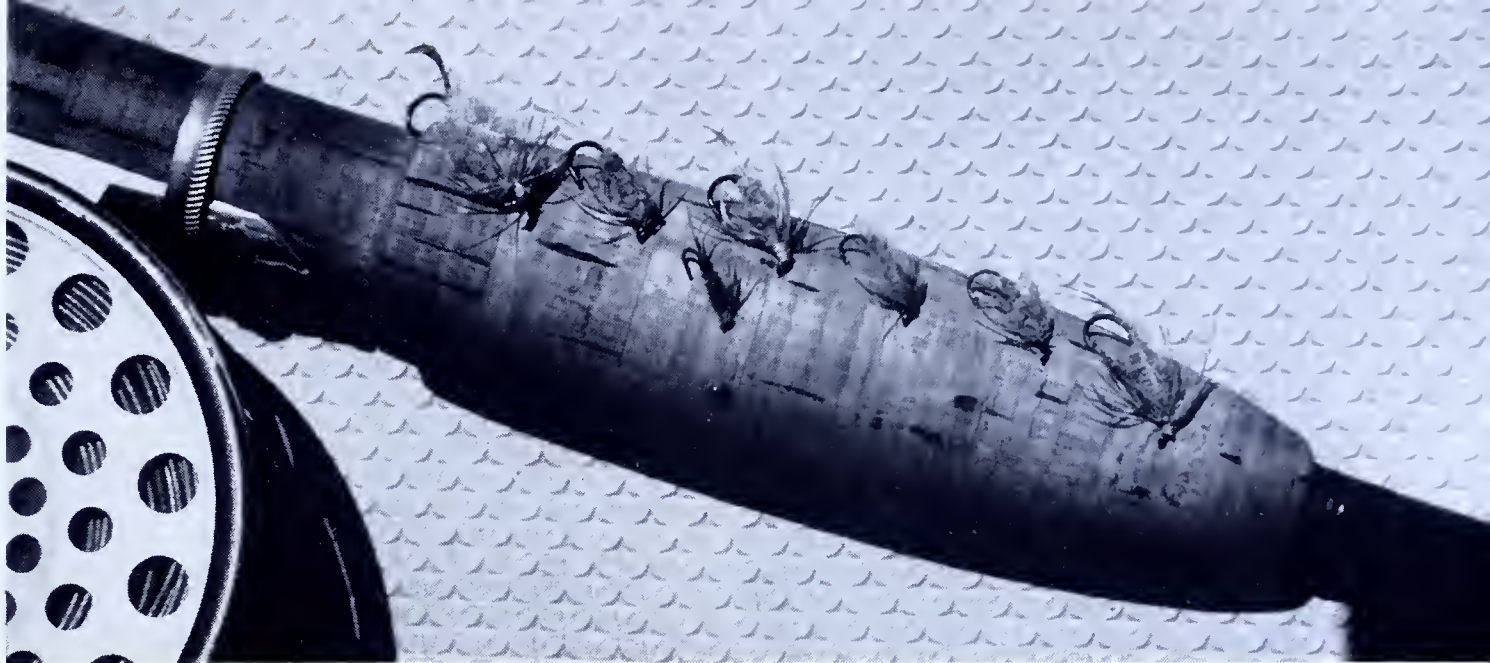
Hook: Size 14—2X long-fine wire

Tying silk: Size 00—green

Body: Deer body hair dyed pale green

The method of tying the Inch Worm, as shown in the accompanying photographs, embodies the use of a single tuft of deer hair, about the thickness of a pencil, tied in a bundle on top of the hook shank and not permitted to spin around the hook. The hair is tied on, butts forward, at the eye of the hook and the thread is spiralled around the hair, continuing to the rear beyond the hook's bend to form a short extended body, then spiralled forward and tied off on the bend, flush under the body.

A fairly heavy tying silk should be used since each turn should be pulled up tight to give the body a segmented effect. A firm, constant tension should be maintained from start to finish in order to prevent the body from turning.



NYMPHS TAKE TROUT . . . properly fished, that is . . . note very fuzzy bodies for simulated translucency. (left-right)—Big Grey, Smaller Grey, Hare's Ear, Mink, Rabbit, Fox and Seal. See Shenk.

as much as any in the state. The fish keep feeding, but tend to bottom feed, except during a good hatch, or on the infrequent days when the stream is quiet. This is pocket water fishing with a high percentage of the pockets containing at least one receptive trout. I have a fishing buddy who fishes this stretch almost exclusively with nymphs, and the way he makes those trout sit up and beg for his cressbug imitations is a sight to behold. And he can tell you about a couple four pound rainbows which bottom bouncing nymphs fooled completely. To be different I sometimes bounce a favorite streamer the same way and the nymphing technique once learned can be used to good advantage in that manner too. I have pictures of some healthy browns to prove that. But that's another story.

Being in a position to observe the trout you are fishing for is an enjoyable way to fish nymphs.

At times, when the fish are really active in their feeding you will see them dart a few feet to take an underwater bug, sometimes shaking their heads, as they engulf it. At other times you must tease the trout into taking by repeated drifts close enough to the trout so that it won't have to move to take the fly. Watch the fish closely and when the trout takes you'll notice the white on the inside of the fishes mouth. Strike then, quickly, but gently.

There are times when the hatching nymphs bring the trout closer to the water surface: the fish refuse dry flies but are obviously feeding. That's the time to tie on a nymph suggesting in size and color the one that is hatching. An upstream or cross stream cast with the nymph drifting just under the surface is the meal ticket in this situation. On a cross stream cast it is best to have the fly hit the water four or five feet above the feeding trout, and rather than watch the line, watch for the bulge of the fish. By watching the bulge you can cast more slack in the line thus partially insuring a naturally drifting nymph.

If, by this time, you're wondering what sort of nymphs to use, just read on. I'm purposely saving that for last. If you don't read that far it's probably because you aren't

going to try nymphs anyhow. If that's the case why bother knowing which patterns I suggest.

Don't get the idea that the upstream cast is the only effective way to fish with nymphs. It isn't. At times a down and across stream cast is just what it takes. In fact you can use the same casts as in actual wet-fly fishing, the only difference being the fly on the end of the leader. Fished down and across, allowed to drift until directly downstream from you, then worked back in a jerky manner can be quite effective. The idea is to know more than one method of nymphing, and use the one which seems to attract the trout at the time.

Many times in a full days fishing I've had to use just about every method I've mentioned in order to take trout throughout the day. I've started in the A.M. with a big nymph, fishing a natural drift close to the surface. As the sun climbed higher I added weight to get the nymph closer to the bottom. The afternoon breeze might blow ants, stoneflies or beetles into the water. That's the time for a fur-bodied, buggy suggestion of a nymph which hits the water with a noticeable splat, provided the bugs are hitting the water with a noticeable splash. Use your eyes and your head, and when a trout is feeding on a nymph or bug which behaves in a certain manner try to make your fly behave the same way. The same day might bring a good nymph hatch close to dark. That's the time for drifting a nymph on or just under the surface. Of course use the one which closely suggests the natural in size, shape and color.

At dark I go back to the big nymph, such as the big grey nymph and fish across and down with a tight line. By this time it's too dark to watch a twitching line for a natural drift, so the tight line is the best means of feeling a striking trout. Of course if you're a meat fisherman you wouldn't have to fish all day to get a limit, but one good trout means a lot more than any limit. Let the egotists take home their limit so they can show how good they are, as for me I'll still be fishing when the last rays of the sun have left the water.



—Don Shiner photo

Today there are quite a few good nymphs on the market. My preference is for those made from various furs.

After years of trial and error I've whittled my personal nymph collection down to a few patterns. Of these patterns I still carry a box full but mainly duplicates. Here's my nymph assortment. They work for me, and they'll work for you. Just remember it isn't always what you use but how you use it. I take no credit for originality of these patterns.

First on my list as an all season nymph is the big grey nymph. This I tie in sizes 4, 6, 10, 12 and 14. The tail is a few tan and grey fibers from a feather found on the underside of an English Woodcock wing. The body can be either grey rabbit or muskrat fur ribbed with gold wire to hold it together better. Legs or hackle is another tan and grey feather from the woodcock wing wound on like a regular hackle. I sometimes tie this full bodied fly with a tannish body of fur from the mask of an English Hare. This fly doesn't imitate any nymph in general but in my mind creates the impression of any of a number of insects. Splat a big one on the water and it could be a June Bug or Stonefly. Drift it slowly along the bottom and it becomes a crayfish, a dragon fly nymph, a hellgramite or even a crane fly nymph. Bend on one in size 14 and it looks as much like a cress bug as anything I know, or it could be a caddis worm. Put a big one on a heavy leader after dark and hold your hat. If I had to fish one nymph all season this would be it.

The remainder of my nymphs more closely suggest the classic mayfly nymph. I use sizes 10, 12, 14 and 16 in light and heavy wire hooks. For these I use fur from seal, rabbit, otter, mink and muskrat. I'm sold on fur for bodies of nymphs and very seldom use anything else. Tails on all these are a few fibers from a grouse feather. Bodies are thin at the back, tapering and bulgy at the head of the fly. I rib most with gold wire to give the body a segmented look. Legs of these nymphs are again wing feathers of the English Woodcock, one turn. I use these flies depending on the color and size of the nymph which predominates at the time of fishing. Colors depending on the type of fur used range from cream to dark brown. My pet of these is one which I call a hares ear nymph. This I tie of hares ear fur, and make the body fairly shaggy. It's a real killer all season, but at its best during the light cahill and sulphur hatches. And I have one tiny box filled with midget nymphs sizes 18, 20, and 22. Of these my pets are a cream one made with fox fur, and a dark brown one made with seal fur. I use two wisps of grouse for a short tail, wind the diminutive body of fur tapering it to bulge slightly at the head, and add a couple short whiskers of grouse. It's a simple fly to make, but sometimes its use can mean the difference between a successful trip and a dismal failure. And don't get the idea that these tiny flies won't hold big trout. They will. I pinch the barb down on most of my flies to make it easier to release fish, and always have more trouble releasing a trout from a size 20 than I do from the larger flies.

Give nymph fishing a try, won't you? Buy or tie a few flies, and take a little time to learn to fish them properly and you'll catch more trout. One more thought. Don't gain a fishing reputation by the number of trout you kill, but by the number you can catch and release to fight another day.—Ed. Shenk

Wet Fly Styling

■ Here in Pennsylvania, and it is probably true elsewhere, the good dry fly fisherman will catch more trout during the course of a season, but the good wet fly man will take larger ones. I am speaking of course, of the fishermen who fish one type of fly consistently. Most of us who use both types will probably admit that we do take larger fish when using the sunken flies. This is due to the reluctance of larger trout to take surface food, unless there is really a sizeable hatch to overcome their timidity.

The great majority of fishermen cast their wet flies downstream and retrieve them in jigging jerks back upstream. This is the old accepted method, and there is nothing wrong with it, except that it is used far too frequently. On a day when the trout are taking wet flies, this method will make a limit catch with very little trouble. The chances are, however, the fish will not be large ones. Your catch will mostly be made up of freshly stocked fish. The old fashioned downstream cast does not often interest the adult fish in the pound and up division. To catch these fish we must add a few variations to our wet fly technique. The first thing to do is make a half turn in our boots so we are looking across the stream, instead of facing directly downstream. From this position we can cover more water without wading or walking, which is a good idea when doing any kind of fishing. Cast across, or slightly upstream, and then continue with your retrieve. This business of the retrieve is a most important factor when considering wet fly fishing (across or downstream that is). The easiest rut for an angler to slide into is singleness of method. We fall into a set pattern of retrieve, and it is difficult to break away from it. Every angler who uses wet flies a great deal has his own variations on the methods employed when fishing them. Generally these methods fall under three main categories: The dead drift, the rod jerks or bounce, and the hand twist retrieve.

The dead drift is exactly what the name implies. The flies are cast across the current and allowed to drift with no manipulation, until they reach a point below the angler. Then they are picked up and cast again. It sounds extremely simple, and it is. Easy as it might sound, this method is used very little by the vast majority of fishermen. This is not as it should be for this manner of fishing the wet is most productive at times. The dead drift is especially effective when there has been a heavy fall of spinners on the water some time before you commence fishing. These insects in their last stage of metamorphosis have returned to the water to mate and die. These dead spinners do not stay afloat for very long, and their sunken and semi-sunken bodies are a very easy mark for feeding trout.

When the fish are taking these nearly lifeless creatures, they do not have to exert much energy. For this reason any hastily maneuvered wet fly will not interest them, and may even, and usually does, frighten them. The dead drift method requires that a fairly good imitation of the fly that the fish are taking is used. When the fly is merely coasting with the current the fish has an excellent opportunity to give it the "once over." When using this dead drift method, the strike will often come as a slight tap, which can easily be mistaken for a chub. At other times, especially when your flies are drifting drag-free the strike will be indicated

by merely a twitch of the line or leader. The best policy of course, is to strike at any happening which appears out of the ordinary. Many times a strike applied by hunch alone will produce a nice trout.

The old standby method of jigging and jerking your flies across or upstream is the most used style in the east. While, as I have mentioned before, it is somewhat overworked, it is often the best method to use. This is nearly always the case when we are fishing for newly stocked trout. For their first few weeks in the stream, hatchery trout are particularly fascinated by rapidly moving flies and lures. So much so, that I have seen certain trout caught as many as five times in the course of a morning on the same fly! Rainbow trout, and our native brook trout are also extremely susceptible to this method. In the case of the rainbow, this may be due to his origin in the fast moving rivers of the west coast, where food must be captured quickly, or not at all. In the Allegheny Mountain area the brook trout, being found mostly in the smaller streams and brooks, must grab every bit of food he can possibly secure in order to survive. This is due to the low food producing qualities of these typical brook trout streams. So much for the psychoanalysis of the various species. To get back to this style of retrieve, it seems to produce better results when the brighter patterns of flies are used. Somewhere on your string of flies there should be a silver tinsel pattern. In my opinion, silver tinsel is much better for wet fly use than gold. It doesn't seem to lose its luster so quickly, and it appears that trout seem to prefer it to the gold. A little Montreal Silver, or any standard pattern tied with a silver rib or body is about what's needed. The various styles of the Coachman are also very good. There is much ado about what the trout assume these flies to be. They certainly imitate nothing in particular. (Perhaps the trout take them for small darting minnows.) Because your flies are being pulled towards you, this method usually does your hooking of fish automatically. Trout usually take these quickly retrieved flies with a slashing surge which usually proves to be their downfall. If one of these splashy strikes is missed, a cast which is put directly back into the spot will sometimes bring a second strike. Small brown trout and brook trout will often strike a fly again and again until they finally manage to hook themselves. Sadly, this is not true of their larger brothers.

The hand twist retrieve is probably the best method of fishing the wet mainly because it is the most versatile. This style requires the use of both hands, which keeps the angler in much better control of his flies. The flies are cast as usual across or slightly upstream, and they are retrieved by folding the line in loose coils in your free hand. If this is done correctly the line will shoot out nicely when you commence your next cast. If the retrieve is not done too quickly this method will convincingly imitate the struggling rise of a mayfly nymph to the surface. The speed of your hand twisting is very important in interesting the fish. Many times I have slowed down my retrieve and caught fish, when more rapid twisting would not even arouse a chub. It is easily seen that the hand twist may be easily combined with the other methods, making the variations almost limitless.

One of the favorite methods used here in Potter County is to cast about twenty degrees upstream, allow your flies to sink until they reach a point opposite you and then to



—Don Shiner photo

retrieve the flies slowly until they reach the surface. Allow them to hang there motionless for a few seconds and then cast again. Simple and very effective! This particular brand of sunken fly fishing calls for the scraggly fur-bodied flies and nymphs, such as the Hares Ear, the Dark Hendrickson, and the American March Brown.

Nearly everyone who does a little piece such as this usually winds up recommending a list of wet flies. I won't be different, but instead of naming the patterns themselves, I'll simply mention the general ingredients. This is almost a foolproof way to avoid any disagreement with other anglers.

April 15 to May 10; brown hackled patterns with peacock herl bodies and some blue grey flies with meaty-looking fur bodies.

May 10 to May 30; quill and tinsel bodies with wood duck or mallard wings.

May 30 to June 10; white and cream bodied flies (a few on size 10 hooks)

June 10 to the end of the season; smaller flies with sparse bodies and thinly hackled, lighter colors should predominate.

Flies answering the brief descriptions listed can be interpreted in many ways. And this was really what I intended to suggest. For with flies as with other earthly things, there are many opinions. While fly pattern is important, especially in wet fly fishing, the pattern which seems to perform wonders for one angler will produce an absolute zero for others. One very fine fisherman whom I have known for many years uses nothing but the Hares Ear regardless of the hatch, weather or other prevailing conditions. He catches his adequate share of trout and out-catches all other fishermen on many occasions on a *particular* stream. He is of course a very fine angler, but he works one stream almost constantly, and knows nearly every fish in it by its first name. Anglers of this type, because of their intimate knowledge of a special stream, can do well with nearly any fly. They know where each fish will be at a given time, and the best manner in which to approach him. The Hares Ear simply happens to be "his" fly.

There are other equally good anglers (I'm sure you must know one) who carry hundreds of wet fly patterns on the stream. They try to match nature's every creation with one of their own. Some of them often do a very good job of this. Here again we are faced with one of fishings great unexplainable opposites. The one fly man vs. the many fly man. Both fish the same stream, both make fine catches. What are we to believe? It simmers down to this. Fly pattern is important—but—the method of fishing your wet flies is the prime factor when the days baskets are compared. The most sound advice which I can offer is, don't fall victim of a single method of using wet flies. Mix up your styles of casting and retrieving until you find one which will work on a particular day, or stream. But don't expect that routine to work on the next angling adventure. Trout are not that gullible, a feature for which they are especially noted and admired.—L. James Bashline

Casting Position

Efforts to secure favorable casting positions have led to some embarrassing situations, one in particular. It was on Broadhead Creek long ago, so long we can easily bear up under a full confession.

Some large brown trout started rolling near far shoreline. After long hike upstream, crossing stream, another long hike downstream there was no way down a steep forty foot bank. The old browns continued rolling, their size seeming to grow by the minute. We finally found dishpan in nearby trash hole, decided to sit in it and glide down the bank.

The landing field was stream-side bush that might stop progress before gliding out into swift water. But the bush concealed a boulder and we were severely battered. For once, fishing was entirely forgotten. While resting, darkness descended and heavy rain started coming down.

There was no way up the precipitous slippery bank, either up or down stream. Both ends of the bank ended with undercuts where swift water swirled over huge boulders, and a swimmer would be swished into the roaring rapids. Only way out was up the bank. The hunting knife was used to dig passage-way with steps so felt soles would take traction. As we staggered bedraggled into hotel room Mom remarked: "You're WISE to come in out of the rain."

We often fish up convex sides of streams where banks are high, steep, brush-boulder laden; and sometimes almost inaccessible. Before moving up the convex side we take a concealed position on concave side of stream, and watch the fast water area for rises in front of submerged boulders or eddies behind projections into the current. The large browns inhabiting pockets in fast water are amazingly easy to catch, if cast is made from position directly below.

It's waste of time casting to large brown trout across currents; so unless there is a position for an upstream cast we look for another fishing hole. However, before bypassing one we take plenty time, look carefully over everything, maybe return to car for waders and wade up the convex side. Unlike in pools, the wading-approach is somewhat concealed by fast water. On occasions we have given up, but returned and found way to take a wary brown. Needless to say there are a few like one under the overhanging branches. He is still there after two unsuccessful return trips.

When fishing upstream we lay casts directly up. The leader is ten feet tapered to 4X (.021-.007) when casting a size 10 lure, twelve to thirteen feet to 5X or 6X when casting sizes 12 and 14. The leader is made to sink, at least few feet from lure, by rubbing it with mud, soap or leader-sink. With good presentation on a quality leader the particular lure is of minor importance. However, our preference is 14 or 12 Quill Gordon on sunny days, 12 Light Cahill or 10 Caribou on cloudy days.

On several occasions we have failed to take a large brown trout with curve or slack-in-leader casts across currents then crossed over and easily took him with direct upstream cast.

—Art Clark

★

Perhaps what we need in these hectic days is a calmplex.



When the Commission Had a Private Fish Car

Yes . . . those were the days when the Commission (Board of Fisheries then) had its own private railroad car to transport fish throughout Pennsylvania. It was equipped with many hatchery and fish management tools but was used for stocking trout and other fish in the streams of the state that closely paralleled the rail lines.

It was seldom possible for the Commission (or Board of Fisheries) to use the car, appropriately named the "Pennsylvania" in 1905. The railroad companies insisted on charging a uniform rate of 20 cents per mile for carrying the car in both directions. Thus, to take a load of fish to a point 100 miles from the hatchery would cost \$40 for 200 miles; 100 for toting the fish and 100 for bringing back the empty car.

The appropriation of funds then would not permit such an expenditure, at least, to the extent of using it regularly for the delivery of fish. For the greater part of the year it remained in the car barn on the hatchery grounds at Bellefonte and employed only when necessary to run fish from one hatchery to another.





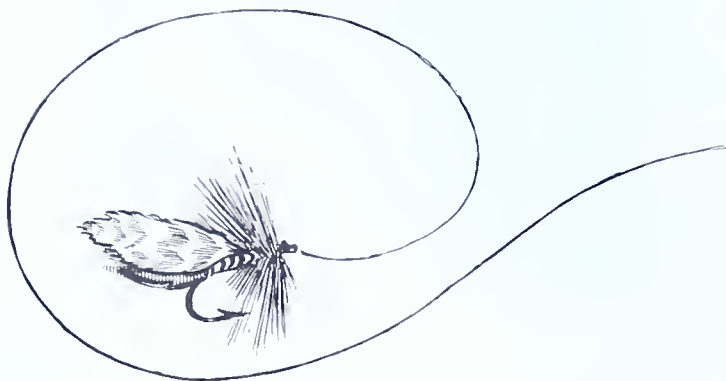
April Fool

Dry flies deceive trout. But can a spider tell an artificial fly from the real McCoy? Try it!

I dropped a big fan wing dry fly into a web that clung like lace to weeds along the bank. A spider, getting the message of a tasty meal, raced across the silken threads and immediately began whipping strands of sticky web around the fly. The threads were soon looped and roped around the wings, then to several hackle "legs" and finally to the tail. After several moments of effort, the spider stopped to reconsider the situation. "What's with this jerk?" pondered the spider. Finally, losing interest in this strange dadgummed critter, the web builder sheepishly climbed to its perch above the silken net.

I retrieved the fly from the web, tied it to the tippet of my leader, reflecting on the sanity of my experiment. Flipping into mid stream, it landed as softly as the down of a thistle. SPLASH! A trout grabbed it as speedily as did the spider, both fooled!

What pattern? A Ginger Quill.—*Don Shiner*



THE EMERGENCE TABLE ►

■ When I first originated the "Trout Stream Insect Emergence Tables" I had no conception it would ever attain its present day popularity and usefulness. I realized however, that it would be a helpful tool for anglers for they could then plan their fishing trips, knowing in advance what trout stream insects they could expect to find over the water.

It has been a long time since I compiled the table back in 1940 and since then, year after year, I still receive letters attesting to its usefulness. Looking back over it now in retrospect, the original table has not changed radically. Now and then some years, probably influenced by the climate, has either advanced or retarded the date when the nymph emerges from the water and takes wing. However, except in one or two isolated cases, this variation is slight and hardly ever exceeds two or three days at the most. The isolated case mentioned above occurred in 1957 when the Shadfly, *Ephemera guttulata* was seen flying over Penns Creek on May 17th, over a week earlier than its normal emergence period of May 26th.

A recent addition to the table is the inclusion of the Penns Creek Caddisfly, *Brachycentrus numerosus*. Tentatively, I am putting its emergence date as of May 8th, however, I am not sure this is correct since all my records, diaries, etc., are in my log cabin on Penns Creek. In any event, this date is close—the fly appears early and stays late, longer than any other trout stream insect.

The table follows:

TROUT STREAM INSECT EMERGENCE TABLES

By CHAS. M. WETZEL

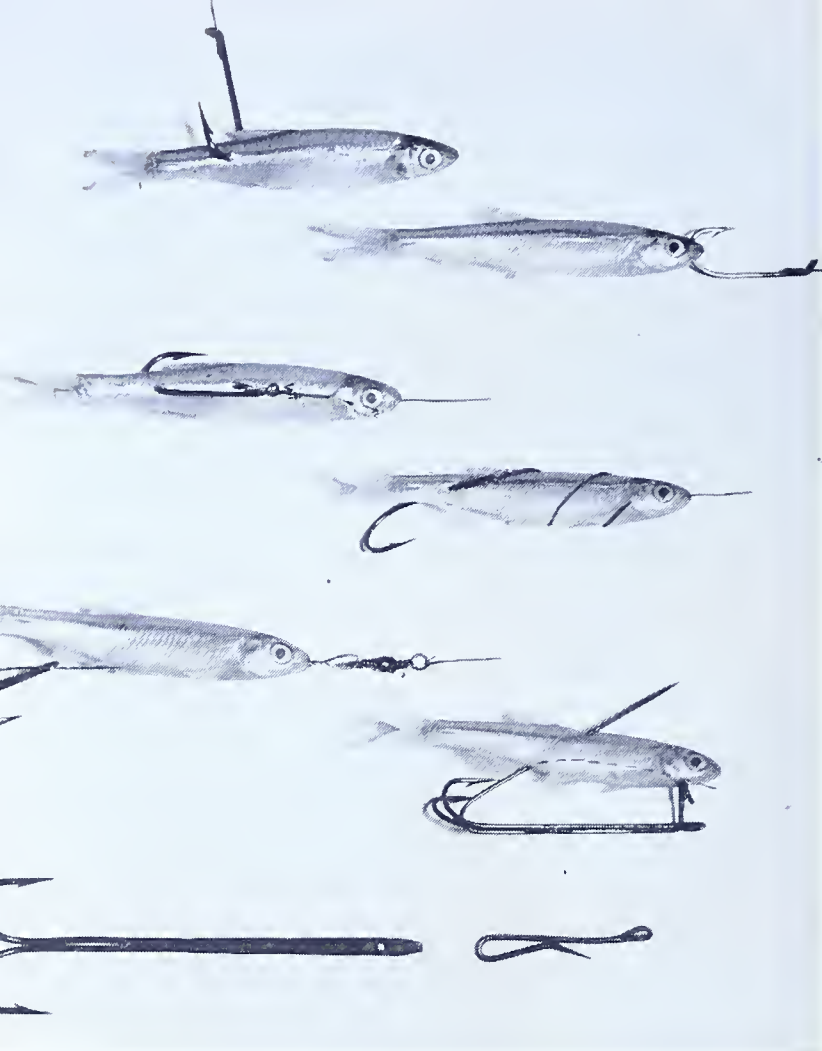
Common Name	Scientific Name	Habitat	Emergence Date
Little Black Stonefly (3)	<i>Taeniopteryx maura</i>	Pa., W. Va., Tenn., Mass., N. Y., Minn., Mo., Md., Kan.	Apr. 15
Red Quill (1)	<i>Ephemera subvaria</i>	N. Y., Pa., N. J., Ont., Quebec	Apr. 16
Little Black Caddis (2)	<i>Epeorus pleuralis</i> , <i>iron fraudator</i> <i>Chimarra aterrima</i>	Pa., Can., N. Y., N. J., Del., Ind., Ga., Fla., Wash- ington	Apr. 17 May 1
Red Legged March Fly (5)	<i>Bibio femoratus</i>	Pa., N. Y., N. J.	May 1
Smokey Alderfly (5)	<i>Sialis infumata</i>	Que., N. S., N. Y., New England, N. J., Pa., Wash., Mich., Ill., Minn., Calif.	May to Sept.
Black Midge (5)	<i>Glyptotendipes lobi'erus</i>	Pa., N. Y., N. J., Ont.	May 1
Light Stonefly (3)	<i>Isoptera signata</i>	Pa., N. Y., N. S.	May 8 to May 25
Penns Creek Caddisfly (2)	<i>Brachycentrus numerosus</i>	Well distributed through the northern hem.	May 15
Black Quill (1)	<i>Leptophlebia cupida</i>	Pa., Ohio, N. S., N. F., Ill., Can., N. Y., N. H., N. C., R. I., N. J., Ont., Quebec, Mass.	May 16
Early Brown Spinner (1)	<i>Leptophlebia cupida</i>	Same as above	May 15
Yellow Spider (4)	<i>Antocha saxicola</i>	Well distributed throughout the northern hem.	May 15
Stonefly (3)	<i>Neophasganophora capitata</i>	Pa., N. Y., Md., Mass., Minn., Quebec, N. S., Ind., Ill., Mich., Kan., Tenn., N. C.	May 16
Spotted Sedge (2)	<i>Hydropsyche slossonae</i>	Pa., N. Y., N. H., Ill.	May 20
Pale Evening Dun (1)	<i>Ephemera dorothea</i> and <i>rotunda</i>	Pa., N. Y., Can.	May 20
March Brown (1)	<i>Stenonema vicarium</i>	Pa., N. Y., N. B., N. H., Quebec, Tenn.	May 21
Great Red Spinner (1)	<i>Stenonema vicarium</i>	Same as above	May 21
Green Caddis (2)	<i>Rhyacophila lobifera</i>	Pa., N. Y., Ill.	May 21
Dark Green Drake (1)	<i>Hexagenia recurvata</i>	Pa., N. Y., Mass., Me., W. Va., Mich.	May 23
Brown Drake (1)	<i>Hexagenia recurvata</i>	Same as above	May 24
Ginger Quill Dun (2)	<i>Stenonema fuscum</i>	Pa., N. Y., Ont., Que., New Brunswick	May 25
Pale Evening Spinner (1)	<i>Ephemera dorothea</i> and <i>rotunda</i>	Same as Pale Evening Dun	May 26
Ginger Quill Spinner (1)	<i>Stenonema fuscum</i>	Same as Ginger Quill Dun	May 26
Fish Fly (5)	<i>Chauliodes serricornis</i>	Pa., N. Y., Md., Ga., Ohio, Minn.	May 26
Green Drake (1)	<i>Ephemera guttulata</i>	Pa., N. Y., Tenn., Ont., Quebec	May 28
Black Drake (1)	<i>Ephemera guttulata</i>	Same as Green Drake	May 28
Grey Drake (1)	<i>Ephemera guttulata</i>	Same as Green Drake	May 28
Iron Blue Dun (1)	<i>Leptophlebia johnsoni</i>	Pa., N. Y., N. H., Que., Ontario	May 28
Grannon (5)	<i>Brachycentrus fuliginosus</i>	Pa., N. Y., Wash., Ontario	May 29
Jenny Spinner (1)	<i>Leptophlebia johnsoni</i>	Same as Iron Blue Dun	May 29
Brown Quill (1)	<i>Siphonurus quebecensis</i>	Pa., N. Y., N. C., Ont., Quebec	June 1
Green bottle or			Variable
Blue bottle fly (5)	<i>Lucilia casear</i>	Commonly distr.	June 1
Whirling Crane fly (4)	<i>Tipula bella</i>	Pa., N. Y., N. J.	June 1
Orange Crane fly (4)	<i>Tipula bicornis</i>	Same as above	Variable
Golden Eyed Gauze Wing (5)	<i>Chrysopa occulata</i>	Commonly distr.	June 2
White Mayfly (1)	<i>Stenonema rubromaculatum</i>	Pa., N. Y., Mass., Ill., Ont., Quebec, N. B., N. S.	June 27
White Gloved Howdy (1)	<i>Isonychia albomanicata</i>	Pa., N. Y., Ont., N. C.	June 28
Yellow Sally (3)	<i>Isoptera spp.</i>	Commonly distr.	June 28
Golden Spinner (1)	<i>Potomanthus distinctus</i>	Pa., N. Y., W. Va., Ohio	June 28
Willow or Needle Stonefly (3)	<i>Leuctra grandis</i>	Pa., N. Y., N. J., North Carolina	June 29
Stonefly Nymph (3)	<i>Acronuria lycorias</i>	Pa., N. H., N. Y., Mass., Me., W. Va., Mich., Wisc., Que.	June 30
Brown Silverhorns (2)	<i>Athripsodes wetzeli</i>	Pa., N. Y. Similar species in Wisc. and Ontario	July 1
Big Orange Sedge (2)	<i>Neuronia postica</i>	Pa., Ga., Mass., Wisc., New Foundland and Wash- ington, D. C.	July 1
Yellow Drake (1)	<i>Ephemera varia</i>	Pa., N. Y., Mich., N. H., Ont.	July 1
White Caddis (2)	<i>Leptocella exquisita</i> , <i>leptocella</i> <i>albida</i> , <i>leptocella spp.</i>	Florida to Canada	Variable
Deer Fly (5)	<i>Chrysops vittatus</i>	Eastern and Northern States	July 4
Green Midge (5)	<i>Chironomus modestus</i>	Pa., N. Y., N. J., Ontario	

Note. The number in parenthesis following the common name of the insect indicates the following: 1, Mayfly; 2, Caddisfly; 3, Stonefly; 4, Crane fly; 5, Miscellaneous.

For a more detailed treatise, as well as a description of the natural insects described above together with their imitations, the reader is referred to the following books available at most libraries:

Practical Fly Fishing by Chas. M. Wetzel. The Christopher Publishing House, 1140 Columbus Ave., Boston, Mass.

Trout Flies by Charles M. Wetzel. The Stackpole Company, Harrisburg, Pa.



MINNOW RIGS . . . variety of methods used by top minnow artists for trout



WORM RIGS . . . popular methods showing also spinner combination and worm gang hooks.—Don Shiner photos

Executive Director Day to Speak at Wyoming Sportsmen's Clubs Dinner

Albert M. Day, Executive Director, Pennsylvania Fish Commission is scheduled to speak at the annual banquet of the Wyoming County Federation of Sportsmen's Clubs April 22 at Factoryville, Pa. Warren W. Singer, Assistant to the Executive Director will be Toastmaster. Gene Coleman, outdoor writer for the Scranton Times is handling publicity for the affair.

Susquehanna Clubs to Hold 8th Annual Dinner

The Susquehanna Federation of Sportsmen's Clubs will hold their 8th Annual Dinner April 13 at Mountain View School near Kingsley, Pa. The dinner is held as a memorial to the late Lynn A. Rosenkrans, former Education Assistant, Pennsylvania Game Commission, who did much to promote conservation in the Commonwealth.

★

*And when the timorous trout I wait
To take, and he devours my bait,
How poor a thing sometimes I find
Will captivate a greedy mind!
And when none bite, I praise the wise,
Whom vain allurements ne'er surprise.
—Izaak Walton*

★

Ontario's Sea Lamprey Fishery

Ontario's lamprey fishery is a small one. It keeps two men busy for about a month and a half each year. Lampreys are usually not considered edible. But in some parts of the world, they are a delicacy. There are in Ontario enough Canadians from the Baltic countries, where lampreys are eaten, to make lamprey fishing profitable.

Methods learned in Latvia are used by one of the men to harvest some of the lampreys of Lake Huron. The lampreys are trapped in the spring of the year when they ascend the Saugeen River to spawn. A weir is constructed across the river and willow baskets are set either upstream or downstream from the gaps in the weir through which the water flows. Where they are set depends upon the velocity of the water. The lampreys are trapped in these baskets as they attempt to leap through the gaps. During a night as many as 900 may be trapped by this method. In a season, 10,000 lampreys have been caught.

Each morning the night's catch is brought to the cooking tent, where the lampreys are decapitated and roasted on both sides to a golden brown. After roasting they are sprinkled with brine and pressed between two blocks of wood. They are then either packed in bowls or put into cans. So far, the market for lampreys has not been saturated and what is produced is sold in Toronto.

It is interesting to note that the lamprey was a prominent dish of the medieval banquet table. It contains 32 per cent oil and 567,000 units of vitamin A per pound.—*Commercial Fisheries Review*



Skipper

BOAT NUMBERS

DC 1234 BB	dc 1234 bb
DC1234BB	DC°1234°BB
BB4321CD	BB 4321 CD

During your cruising last summer, you undoubtedly noted the variation in the way boats have been numbered, and you undoubtedly did a double take. The law seems to be explicit on how the assigned letters and numbers are to be displayed. Yet we can't discount that many well-meaning persons either haven't bothered to read, or simply have misinterpreted the regulation. And there are those with a flair for originality that made for some interesting, admittedly decorative, arrangements—but not consistent with the law. Specifically, the numbers must read from left to right and be in block characters of good proportion not less than 3 inches in height. They must be of a color which will contrast with that of the background. Also, by regulation, the numbers must be separated by hyphens or equivalent spaces from the letters.

Obviously, it was intended that the complete number awarded a vessel be clearly visible for a reasonable distance. Yet, have you seen the letters and numbers bunched up with no spacing? Or, worse still, the numbers reading from left to right on one bow and then reading from right to left on the other bow! Moreover, there are those letters and numbers that are artfully trimmed in a somewhat complementary color scheme so that the characters themselves measure less than 3 inches. What about the white number with very thin border of rich gold or black on a white hull?—the margin of contrasting color being no more than 1/8 inch! Or the Old English script, rustic and spidery modern characters that are used? If at first glance the display looked like hieroglyphics, the chances are it was a case of inverted numbers. With his boat stored upside down on saw horses or blocks in the back yard, more than one owner took pains to apply the numbers properly, yet failed to reckon with the fact that he would turn the boat right side up at launching time!

Coast Guard and State officers have been rather lenient during this first season in which the new numbering law has been put into effect. The Auxiliary Examiner, in checking the number display as part of the examination, has been able to advise a goodly number of operators. However, the authorities are calling upon all boating groups and the industry to assist in making the boating

public aware of the regulations. There should be no excuse for operators not to correct their displays during the winter lay-up. The authorities cannot be expected to be over-indulgent and may start to cite violations after a reasonable period has been allowed for this mass educational program.

It has not been suggested that Auxiliarists conducting the courtesy motorboat examinations accurately measure each boat number nor equip themselves with color charts so that they might suggest the more harmonious, yet contrasting, color combinations. A word of advice from these recognized boatmen on the numbering proposition is normally as gratefully received as that on other legal requirements and recommended safety practices. It's essentially a matter of getting the "right word" to the boat operators.

CAUSES OF BOAT ACCIDENTS

A major insurance firm's statistics point out the most common cause of accidents among pleasure craft and show where more caution should be used in boat operation. Fifty per cent of losses involved lower units of motors striking submerged objects. Losses involving hulls, as a result of collisions, amounted to 20 per cent. Five per cent were losses resulting from boats in transit on poorly designed trailers unable to stand long, fast, overland pulls. Theft, fire, vandalism, sinking and other miscellaneous causes accounted for 15 per cent of the claims. Ten per cent of losses were caused by swamping. Only 5 per cent from all causes were declared total losses.

Recent yearly insurance figures reveal the popularity of outboards compared to inboard craft. The insurance industry wrote more than \$20,500,000 in policies for canoes, rowboats, outboard motors and outboard craft and paid more than \$9,000,000 in claims, this column was told. Among inboards, more than \$1,000,000 of insurance was written and \$599,000 was paid out in claims. The report covered 1960.

The Coast Guard here reports only 11 small craft accidents investigated this year involved loss of life, serious bodily injury or damage in excess of \$1,500. Lesser accidents are now investigated by states under new boating laws. A Coast Guard spokesman said there are doubtless hundreds of minor mishaps never reported to authorities.

A recent survey revealed that boating continues to be a comparatively safe recreation considering that an estimated 35,000,000 men, women and children participate. Boating ranks ninth among the 10 major types of fatal accidents in the nation. Fifty-four per cent of fatal boating accidents were caused by negligence such as standing in a boat, overloading, reckless operation and sudden maneuvering.

Weather conditions including windstorms caused 13.7 per cent of fatal accidents. In 7.9 per cent of the cases mechanical failure was the cause. Miscellaneous faults accounted for 1.6. Lack of eyewitnesses or unclarified official records placed 22.8 per cent in the unknown category.

The highest percentage of accident victims was in the 15- to 24-year-old group. The water ski accident rate fell from 4.5 in 1958 to 3.9 per cent in 1959. In accidents involving fatalities, 65 per cent of the non-swimmers drowned. A surprising 40 per cent of the swimmers involved in mishaps drowned while 60 per cent survived. It appears that many swimmers over-estimated their ability to reach shore safely.—*Upstream*

(Tear Sheet) List of
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Field Notes

Have A Light, Bub?

Walter D. Bryant, Hyndman, Pa. caught a 24-inch walleye at Gordon Lake. While cleaning the fish he found a cigarette lighter in its tummy. It lit the first flip!

—Warden Wm. E. McIlhenny, Bedford County

Double Insult

On Standing Stone Creek, Huntingdon County, I apprehended a litterbug who not only threw all his garbage on a landowner's property but at the same time helped himself to a Christmas tree from the same property. He now knows the rudiments of proper garbage disposal and henceforth will buy his Christmas tree like the rest of us.

—Warden Richard Owens, Huntingdon-Mifflin Counties

Warden's Worry . . .

Last ice-bound season at Glen Run Lake, I had more worries tacked on me when fishermen complained bitterly about hot-shot skaters weaving in and out of their tip-ups and jumping over their minnow buckets, knocking them over. What next?

—Warden Clifton E. Iman, Butler and Beaver Counties

A Warden Worries

The ice was fine and so was the fishing for anglers at Conneaut Lake one fine Sunday morning. Then an automobile appeared on the ice and went into a series of Immelman Dives, spins, figure eights and the Big Apple, driving all fishermen and equipment ashore pronto. What can you do with guys like this?

—Warden Raymond Hoover, Crawford County



TO RETIRE in April, George Pazle of Pleasant Mount Hatchery has served 22 years with the Pennsylvania Fish Commission

NEW "ANGLER" SUBSCRIBERS . . . PLEASE NOTICE!—Subscriptions received and processed after the 10th of each month will begin with the second month following.

Fisherman's Paradise Opens May 12

Fisherman's Paradise, maintained by the Pennsylvania Fish Commission, on Spring Creek near Bellefonte in Centre County since 1934, will open its 1961 season on Friday, May 12, to extend through Saturday, July 15, excluding Sundays.

Last year's records disclosed that 14,389 fishermen from every one of the state's 67 counties registered there, while 453 came from other states and Canadian provinces. These fishermen creeled 5,473 trout, ranging in size up to the 30¾", 9 lb. 2 oz. rainbow, caught by Eleanor Mathias of Connellsville, and the 30¼", 11 lb. hunker rainbow landed by Catherine Gresh of Spangler.

Aside from the season dates, the Commission made no changes in the regulations from those governing Paradise fishing last year. Briefly, they are:

Daily fishing hours—8 AM to 8 PM, EST (no Sunday fishing) or until Klaxon is sounded; all anglers must register before fishing and checking out; only one trout may be killed after which the angler must stop fishing and the catch must be recorded in detail when checking out; only artificial flies and streamers with barbless hooks may be used; the use or possession of live bait or lures other than flies and streamers is prohibited; all fish under 10" in length, 7" on the ladies' stream, must be returned; wading is prohibited; feeding the fish is prohibited except on Sunday; a Pennsylvania fishing license is required; fishermen are limited to 5 visits during one season; all foul hooked fish must be returned, and fish may be cleaned and dressed only at designated places.

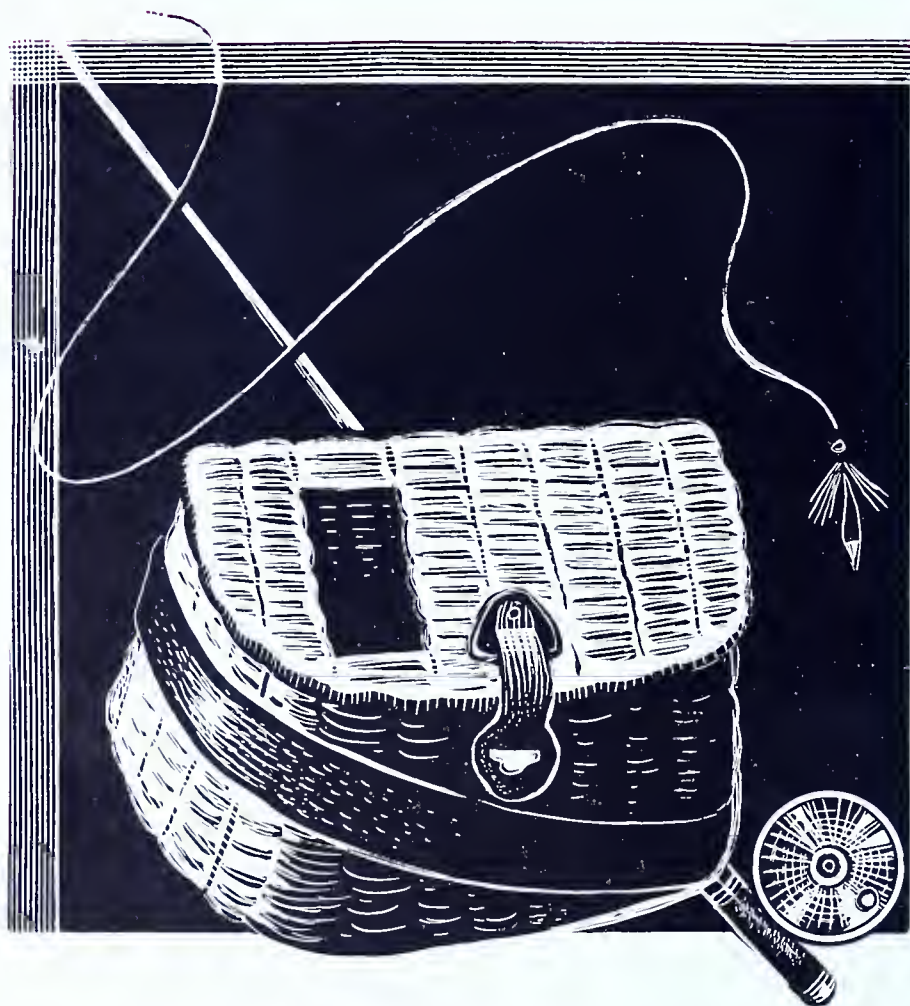
Rare Fish Taken in Lake Erie

Late last fall while in the process of cleaning out live fish tanks, William Ralph, of the Ralph Fish Company, Erie, Pennsylvania found a live white perch (*Roccus americanus*) in one of the tanks.

Apparently the fish was captured along with other fish in commercial pound nets set in Lake Erie to obtain live fish for inland transfer purposes.

The White Perch is considered rare in the upper Great Lakes, including Lake Erie. In 1953, the same commercial fisheries operators obtained 3 specimens of white perch which constituted the first known record of these fish in the Great Lakes above the Niagara Falls. Just how and when the white perch was introduced into the waters of Lake Erie is unknown.

The white perch superficially resembles the white bass (*Roccus chrysops*) and is very abundant in the tidal water regions of the Atlantic Ocean where annual production by commercial fishermen approaches several million pounds. It is also taken in large numbers by hook and line fishermen. The fish may reach a length of 14 inches, but average length is about 8 to 9 inches. It is considered an excellent food fish.



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Pennsylvania

Angler

May

1961

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MAY, 1961



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GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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Cover Photo—W. T. Davidson

Back Cover—The "Tunkhanna"—Gerry Snyder

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GOOD FISHING *returns to*

MUDDY CREEK

By

R. A. YOUNG, Soil Conservation Service

PAUL MARTIN, Pennsylvania Fish Commission

★ Good farming and good fishing go hand in hand. At least that's the theory that people in fish management have told us for many years. There are many examples where conservation measures have kept soil out of good fishing streams.

Many anglers have heard of this. But the skeptics say that seeing is believing. For the Cynics then, Muddy Creek is the place to get the message. This 24-mile long creek in the rolling hills of southeastern York County, Pennsylvania, is one of the most productive trout streams in this area. Many a happy angler can attest to this.

During the fishing season, it is a favorite gathering place for anglers from Pennsylvania and Maryland. From their tractor seats and through their open barn doors farmers of the area listen approvingly to the shouts of success floating upward from the valley floors. Among Penn's numerous, excellent farmers, those who work the productive soils along Muddy Creek are unsurpassed. Some 250 of them, of generations-old Welsh, Scottish, Irish and Dutch stock till the lands that drain into the North, South, and Main branches. Today's visitors marvel at the abundant production coming from the well managed contour orchards, fields of corn, small grain, potatoes and canning crops and lush grasslands on which graze fat herds of beef and good producing dairy cattle. Looking a generation backwards, these farmers will tell you that the picture, then, was nowhere near as rosy. The angler needs to linger and question these men of the soil, for the Muddy Creek story is really theirs.

All the way from Red Lion to a mile or so north of Peachbottom, at which point the stream pours into the Susquehanna, the story runs about the same.

Ever since these soils have been first farmed, some 200 years ago, until some 20 years ago, there was little thought given to wise land use. This was true not only here but all over the country. Many times the man who plowed the

straightest furrow, even if it went up and down the hill, was considered the best farmer. Favorable conditions were set up for every rain to carry more mud into nearby streams.

Muddy Creek truly lived up to its name. But as long as a rural lad could spear a few suckers or flip a string of fallfish from the murky waters, hardly anyone gave the stream a second thought.

But physical changes began to be noticed. Farmers became gradually aware that it took more lime, fertilizer and work to crop a bushel of corn, tomatoes or potatoes. Rains, instead of moistening the fields to plant-root depth, went rushing down the slopes wildly, taking plants and soil with it. Water levels in streams shot up and down in erratic fashion. For weeks after a storm, the Creek looked like it flowed straight from a coffee urn.

Meanwhile, the ever increasing pressure of sportsmen was focused on Muddy Creek. Handy, generally fast-flowing, with much of its lower reaches wooded—why wouldn't it make a good trout stream?

The answer, according to tests made by biologists of the Pennsylvania Fish Commission, was that the water was too turbid for trout. For the time being, that was that.

In the early 1930's a brand new philosophy of action in the face of increasing land ailments had begun to sweep across the nation. It took shape from black clouds of dust that swept for 2,000 miles out of the west and blotted out the sun as far east as New York City. From it materialized a new way of farming. The Civilian Conservation Corps, stationed at Glen Rock, demonstrated to surrounding farmers this new way of farming. Their vanguard reached the rim of Muddy Creek watershed on the west. In a few years' effort, they left an indelible stamp in the form of strip cropped fields, gully control structures, reforested hillsides, improved pastures, sod waterway, etc., on a score of farms.

BACK IN 1937 soil conserving practices were still on the drawing board. The nation was just beginning to recognize the seriousness of soil erosion. By then many streams like Muddy Creek flowed heavy with sediment loads eroded from the farmlands.



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MUDDY CREEK isn't Muddy anymore. The shift to conservation farming made the difference. Most evident of the changes in farming practices are the contours and strip cropping patterns which have replaced the erosion producing up-and-down hill tilling methods of the past.



It was to this new way of land use that hundreds of other Muddy Creek farmers turned as their erosion problems increased. The result of more than a decade of this conservation experience brought about the formation of the York County Soil Conservation District. This local organization helped make available to landowners throughout the county the services of several federal and state agencies. One such agency which now serves the landowners through this district is the U. S. Soil Conservation Service. Based on a knowledge of the soils and their capabilities the technicians started to assist the landowners in developing conservation plans to correct this erosion.

The changes of land use along Muddy Creek was a long, year-after-year job, rearranging fields and altering the direction of tilling and planting. The big job at first was to sell the landowners the new ideas of conservation farming. Much of this work was done by the directors of the district.

A good sketcher of recent events on the Muddy is Chris Musser, Chairman of the York County Soil Conservation District. "Here are some of the reasons why fish have come back. Look at this pair of aerial photographs, taken twenty years apart. See this one taken in 1937. Notice those farms down there, all square fields and crop rows as straight as bowling alleys. You can actually see the soil washing from 12,000 feet in the air!"

"Now, look at this latest picture. Where are the square patches? Mostly gone, aren't they? And the fields are bigger, patterned with long graceful curves. Those are contour strips, grain, grass and row-crops, side by side, on and on. Each strip is like a dam, stopping the runoff, holding the moisture. That's why the mud isn't going into the streams."

Musser says more than half the Creek farmers have embraced soil conservation.

For the angling side, the authorities are the junior author, who has watched Muddy as State Fish Warden for eight years and Robert Bielo, Regional Fishery Manager since 1956. "We noticed the water was clearing faster after rains along about '55. Sure enough, a turbidity check showed this factor had lessened. We did a light job of pre-season stocking for a couple of years just to watch results. The trout grew well and even held over and there were some nice catches."

"Therefore, for the past four years, we've stocked Muddy both pre-season and in season. The Main Branch gets five stockings in season. As yet, they do not reproduce but they do survive. I've checked lunkers of better than 20 inches in plenty of creels. And there's nothing lonesome about the banks of the Muddy during season anymore!"

Martin is among the many familiar with the area who speak of the wonderful spirit of cooperation that pervades the efforts of Muddy's farmers and fishermen. The steep banks are not easy to reach. Motor roads cross it rarely, although the Maryland and Pennsylvania railroad bed runs along the streamside (and sportsmen have a high old time riding a flatcar loaded with fish when they assist with the stocking).

Farmers are notably helpful in letting, even guiding, fishermen across their land to the angling hot spots. Farmers have been heard to say, "It's nice to see them having fun; and we enjoy their company, too!" In addition, it's noticeable that angling gear is beginning to be displayed more commonly in crossroad country stores.

Farmers like Hugh E. McPherson with his beautifully contoured peach orchard; V. Kyle Trout, with his near poultry range, Ken Bowman with his contour strip potato farm, and other Muddy Creek's top notch farmers enthusiastic in sharing the fruits of their conservation labors!



CONTOUR STRIP CROPPING is replacing up and down hill farming. Farming on the contour helps reduce the amount of silt from going into Pennsylvania streams.



MUDDY CREEK has changed. Today it is a favorite fishing stream in Pennsylvania. Conservation on the stream's watershed helped make the change.



STOCKING MUDDY CREEK—an annual event enjoyed by local fishermen.

■ Many readers of this article (including anglers and boaters) probably have heard reports on the radio, or read in a local newspaper, about readings on river gages. These readings may have been referred to as river stages or river gage heights. In either case, such a reading represents the vertical distance of the water surface in a particular river above a fixed arbitrary level, at a specific geographic location, and at a specific time.

River gage heights usually fluctuate over a wide range and reflect, among other factors, the effects of precipitation. For example, during the year ending September 30, 1960, the gage height of the Susquehanna River at Harrisburg, Pa., ranged from a low reading of 2.75 feet to a high reading of 18.20 feet, with various other high and low readings in between. Knowledge of these fluctuations is essential for many engineering purposes. Such knowledge also benefits residents in a particular area by giving warning of potential floods or impending droughts. From a recreation standpoint, knowledge of how river conditions vary at different river stages can indicate whether or not boating or swimming will be safe, or whether fishing is apt to be good or bad.

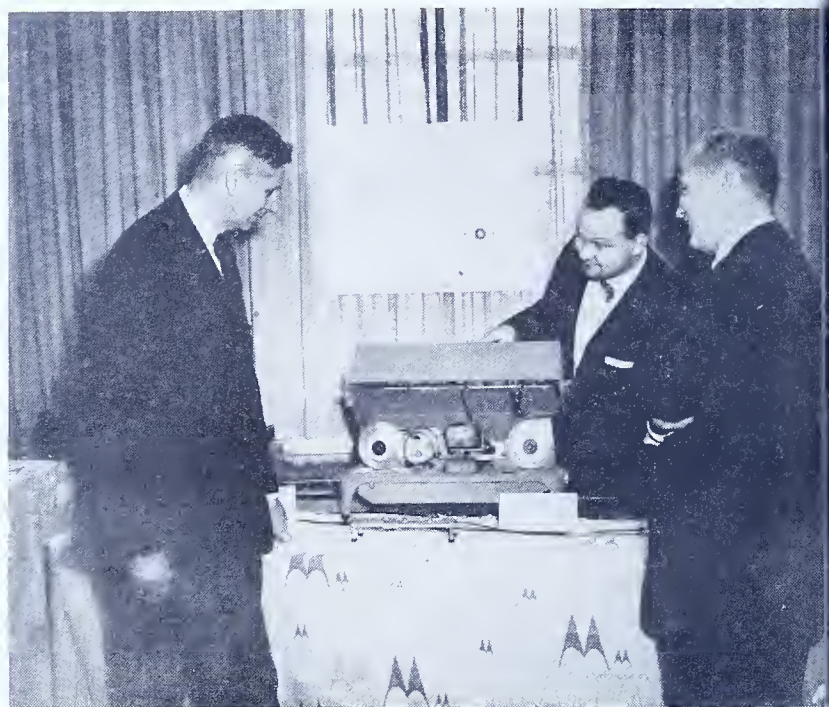
Gage Height versus Depth

Those who are not familiar with the physical characteristics of river channels are likely to equate river gage height to depth of water in the river. The gage height certainly is an indication of the depth of water, but it does not represent the exact depth because of the changing characteristics of the channel bottom. Anyone who wades up or down a stream while looking for a good fishing spot will realize that rivers and creeks are made up of a series of pools and riffles; the water is fast and shallow at a riffle, but slow and deep in a pool. Similarly, anyone who wades across a stream will find wide variations in the elevation of the channel bottom. In addition, the configuration of the channel often changes radically during a period of high water, because of scour of the material in the channel bottom or deposition of new material in the channel.

When a river gage is installed, an attempt is made to place the gage zero at a low enough elevation to ensure that readings of gage height will always be positive. Thus, at the time a gage is installed, the gage-height reading generally will be greater than the maximum depth of water on the natural riffle or man-made structure that controls the elevation of the water surface in the pool where the gage is located. However, the maximum depth of water in the gage pool may be considerably greater than the gage-height reading. At a few locations in Pennsylvania negative gage-height readings are obtained during periods of extreme low water; this indicates that the zero of the gage was not set at a low enough elevation to compensate for the channel scour which has occurred during the intervening years since the gage was installed.

River Gages

Any instrument or device which can be used to determine river stages can be considered a river gage. For the gage readings to be of any value, the gage must be maintained in a fixed position. The datum, or zero, of the gage must be referenced to a point of fixed elevation so that the gage can be reinstalled if it is damaged or destroyed.

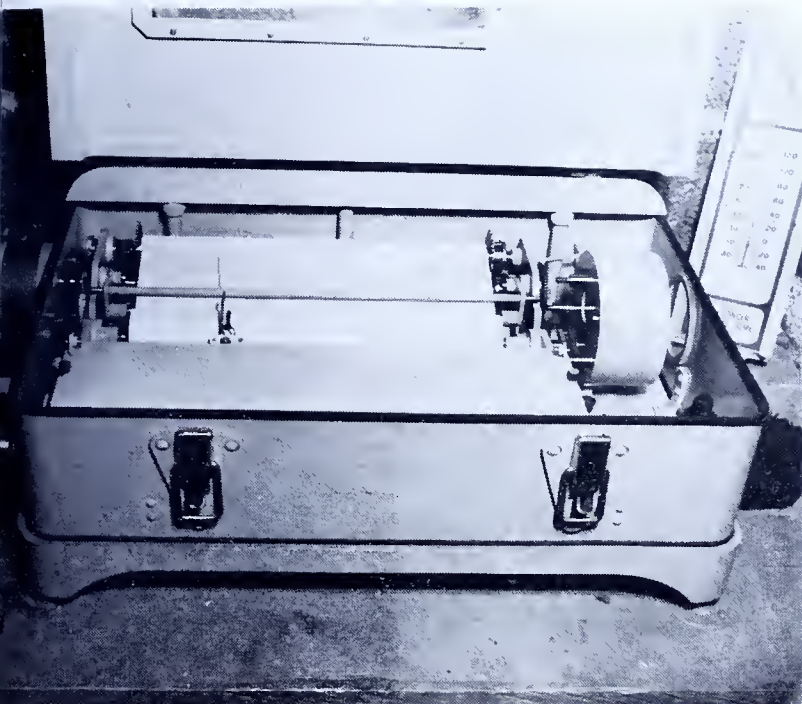


RECEPTION EQUIPMENT for radio signals from stream gaging stations in the flood-forecasting network now located at Harrisburg-York State Airport, in the offices of the Federal-State Flood Forecasting network.

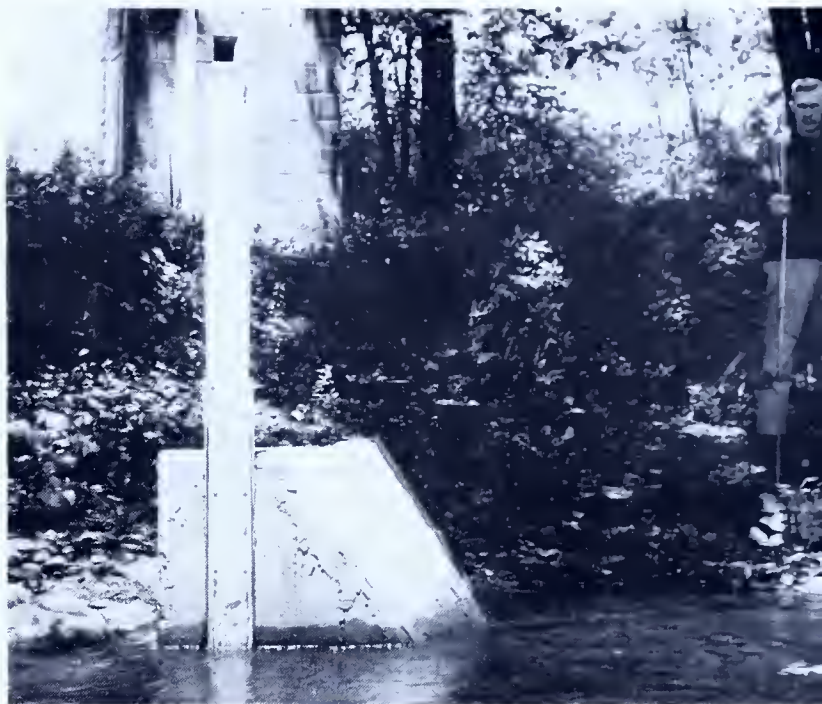
Gaging Station

River gages may be non-recording or recording. As the name implies, a non-recording gage produces no record, but must be read by an observer each time a gage reading is required. A recording gage, through mechanical means, produces a permanent record of the fluctuations in river stage; the record may be in the form of a graph showing a continuous plot of gage height against time, or it may be in the form of punched or printed gage heights at specific time intervals.

A non-recording gage may consist merely of painted marks on a bridge pier or abutment. However, it is a more common practice to use enameled steel plates, pre-graduated in feet and proportions of feet, firmly attached to a suitable backing. Both types of gages are known as staff gages. Another type of non-recording gage is known as a wire-weight gage. This type of gage consists of a wire wound on a horizontal drum, with a small weight on the end of the wire. The device is housed in a small metal box which can be firmly attached to a bridge rail, well above the actual water surface. To obtain a gage-height reading, the weight is lowered until the bottom of the weight touches the water surface; the gage height is then read on a counter calibrated for that purpose.



GAUGE HEIGHT RECORDER, close-up.



OUTSIDE STAFF GAGE at a stream flow station.

Pennsylvania

By John J. Molloy

District Engineer, U. S. Geological Survey, Harrisburg, Pa.

The most common type of recording-gage installation in Pennsylvania consists of a stilling well in the bank of the stream. Water enters the stilling well through horizontal pipes leading from the stream to the well so that the water rises and falls in the well as the water rises and falls in the stream. A structure is provided on top of the stilling well to house the recording instrument. You may have seen such structures along the banks of streams where you have fished. Signs have been placed on most of these structures to indicate that they are gaging stations.

Gaging Stations

A river gage, together with all appurtenant structures, is known as a gaging station when systematic records of gage height or discharge are obtained. A gaging station may be equipped with either a recording or non-recording gage. However, if it is equipped with only a non-recording

gage, readings must be obtained at least once daily, and more often during periods of rapidly changing stage.

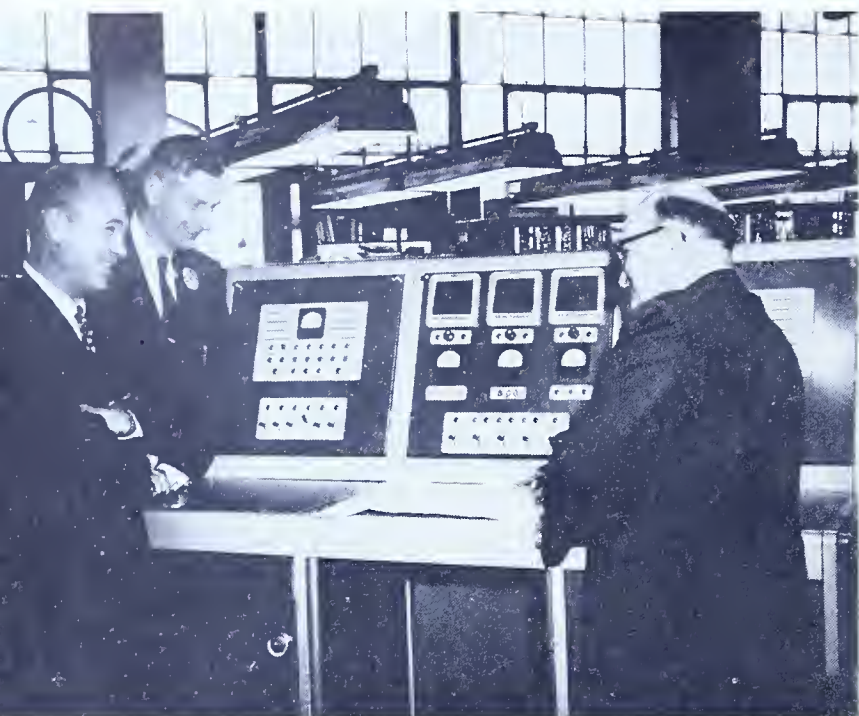
A gaging station at which systematic records of discharge are obtained may be further identified as a stream-gaging station.

Discharge

Discharge of a stream is the amount of water flowing, generally measured as the volume of water which passes a specific location in a particular unit of time. In the United States, streamflow usually is measured in terms of cubic feet per second, but can be expressed in other terms. Ordinarily, a continuous record of discharge of a stream cannot be collected directly. Usually, a discharge record is obtained by measuring the actual discharge at various times and at various river stages, after which technical studies and analyses are made to obtain a relation between stage and discharge in order to convert a record of river stages to a record of river discharges. Knowledge of fluctuations in streamflow is essential for most studies relating to stream behavior, even when the desired end product is information about river stages for such purposes as flood forecasting.

Gaging-Station Network

Systematic collection and publication of stream discharge data throughout the United States are prime functions of the U. S. Geological Survey in cooperation with other agencies. In Pennsylvania, the U. S. Geological Survey operates a network of 170 stream-gaging stations on streams ranging in size from small creeks draining as little as 2 square miles to large rivers such as the Susquehanna River, which at Harrisburg has a drainage area



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NEW ELECTRONIC RAIN AND RIVER LEVEL RECORDER is inspected by Secretary of Pennsylvania Department of Forests and Waters, Maurice K. Goddard (left) and Meteorologist in charge, Paul Sutton, Harrisburg Office, Federal-State Flood Forecasting Service. The devices will automatically record and report stream levels in the West Branch Valley, when new communications system has been completed. The devices are now being installed along Central Pennsylvania streams at points indicated in diagram in background, representing strategic stations in watershed of the West Branch of the Susquehanna River.

of 24,000 square miles. The conduct of the major part of this work is a joint effort by the Geological Survey and the Pennsylvania Department of Forests and Waters. Other Federal agencies, such as the Corps of Engineers, and a few municipalities also cooperate with the Geological Survey in the collection of basic streamflow data.

To supplement information obtained from the network of stream-gaging stations, the U. S. Weather Bureau operates a limited number of gaging stations for stage purposes only; generally, these gages are non-recording. In addition, some industries maintain gages, usually non-recording, for private use; because readings may not be obtained from these gages on a systematic basis and because the results usually are not made available to the general public, such private gages usually are not considered as gaging stations.

Need for Streamflow Data

Many people may wonder what benefits accrue from collection, analysis, and dissemination of data regarding stream behavior. One of the most obvious benefits is the value of predictions of expected flood crests while a flood is in progress. In Pennsylvania, such predictions are the responsibility of the U. S. Weather Bureau through the Federal-State Flood Forecasting Service, which is a cooperative effort of the Pennsylvania Department of Forests and Waters, the U. S. Geological Survey, and the U. S. Weather Bureau. Without knowledge of what has happened in the past, those personnel who forecast expected flood conditions would have no sound basis for making the technical analyses on which to base their forecasts.

The main reason for collecting systematic records of streamflow is to have a basis for estimating what may happen in the future. Such knowledge is needed not only for flood forecasting, but for the planning and operation of any kind of activity regarding the use or control of the water in our streams. It would be uneconomical to develop a costly water-supply system, for municipal or industrial use, without knowledge of the adequacy of the

supply. It is impossible to plan or operate a flood-control system efficiently without knowledge of the quantity of water to be controlled. In the field of recreation, studies of water availability must be made before planning for or developing boating or swimming areas. Most of you are aware of the danger to fish life in heavily-polluted streams. Whether or not fish can live in a stream is dependent not only on the quantity of pollution that enters the stream but also on the quantity of water in the stream; knowledge of expected variations in streamflow makes it possible for a sound pollution-abatement program to be conducted,

Future Operations

It is not feasible to operate a gaging station on every one of the thousands of streams in Pennsylvania. Accordingly, a sampling process is used. Statistical studies indicate that between 65 and 70 gaging stations should be operated on a continuing basis throughout the State in order to give an over-all picture of streamflow conditions. In addition, certain other gaging stations must be operated on a continuing basis for such operational purposes as flood forecasting, planning for and operating flood-control projects, or obtaining information to satisfy legal requirements in connection with diversions of water.

Those gaging stations that are not needed on a continuing basis are operated for only a limited period of time. After sufficient information is obtained at a given site to satisfy a specific need or to give a general picture of streamflow conditions, such a gaging station is discontinued. Existing effort is then used to establish a gaging station at a new site and to collect data at that site for another short period of time. This procedure results in the collection of maximum amount of streamflow data at minimum cost. Although the total number of gaging stations in Pennsylvania remains more or less constant, information becomes available concerning an ever increasing number of streams. It is probable that the same procedure will continue in effect in the future.

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■ Admittedly, fish are a renewable resource. Failing to harvest them is just as much a miscarriage of sensible conservation practice as failing to harvest our deer and other game species. However, there are many times and places, where the general rule must be modified—modified, as a matter of fact, in favor of even better and more sensible conservation practices.

We are told, for example, that rain falling on Pennsylvania is used seven times before it reaches salt water. Since the rain continues to fall, why reuse the water? Why not make use of the next rainfall? We know, of course, that we must reuse our water because there is not enough of it, within some unit of time, to satisfy the demands and needs of people.

In a sense, we have learned to reuse many things, including fly ash from our power plants, the slag banks from our smelters, the limestone dust from our quarries, the wood chips from our forests. Although not strictly a reuse proposition, we are making better use of what, at one time, was considered to be a spent and useless waste product. The idea of reuse certainly is prevalent today.

In many other sports, we reuse the instrument of our pleasure. Consequently, we reuse the No. 1 wood and the putter, the tennis ball, the football, the fielder's glove. We gather up the unbroken blue rocks and the empty brass from the firing line and reuse these.

It seems only sensible that fish should be reused whenever possible. These are, in fact, the object or instrument of our pleasure. And while it is admitted that it is not often possible to treat them as golf balls or badminton nets, there are times and places where it not only is desirable but actually necessary to reuse fish for the continuance of our sport and outdoor recreation.

This, we think, is the main reason for fly-fishing-only and fish-for-fun streams. Their purpose is not one of selfishness; they are not designed to satisfy the whims of a few fishermen; they are not created to appeal to the superior attitude of the fly fishermen.

A sufficient number of experiments have been conducted to indicate that the great majority of trout caught with bait will die on being returned to the water, even though they were handled carefully. Admittedly, the figures vary but, in some instances at least, the mortality figure approaches 100%. On the other hand, a trout caught with a fly, receiving the same careful handling, has an excellent chance of survival on being returned to the water. Although once more the figures vary, they have, in some instances, approached 100%.

If, in a conservative mood, we set the figure in each case at 80%, it would seem worthwhile to us to catch trout with a fly, return them to the water to be caught another day. Fishing is recreation. Although it is sensible to argue that one man's recreation may be fishing with fly while another's may be fishing with bait, it is possible that we can no longer condone this.

Years ago, the market hunter for ducks used a big bertha. This was his way of hunting—his pleasure if you prefer. Yet today, we frown on this practice and have done all we could to eliminate it.

Baiting ducks with corn is one man's pleasure and his way of recreation. But do we approve? Sloppy hunting with bow and arrow is what some choose to do. But do

Fish for Fun — Conservation!

By A. R. GROVE



we approve? We would agree that it is entirely possible to kill a deer with a 22 cal. bullet. But do we approve of it or permit it in Pennsylvania?

The argument that we deprive someone of something when we restrict the method of action is certainly true. But would we, for this reason, abandon sensible methods of forestry and the practice of protecting our woodland against fire? Would we sacrifice contour farming, small watershed protection and the many other valuable instruments of conservation just because they are restrictive and may interfere with the way someone wants to do it?

It is our opinion that fly fishing and fishing for fun are in the same category. It would be foolish and naïve to expect that everyone would agree with this. We expect criticism of various kinds but, in the same honest vein as others, we think the advocates of these practices are no different than those who have originated other conservation practices.

The Age and Growth of

CRAPPIES

in Pennsylvania

PART VIII

by

JACK MILLER and KEEN BUSS
Benner Spring Fish Research Station
Pennsylvania Fish Commission

Photos by
Johnny Nicklas
Chief Photographer
Pennsylvania Fish Commission

■ The crappies of Pennsylvania might be termed the poor man's bass. In fact, they are commonly known as "Calico Bass" and "Strawberry Bass." They are the harbingers of spring lake fishing; they open the season for most lake fishermen. Best catches are often made sometime around Memorial Day, but in summer catches may drop off until one would think that crappies are non-existent.

Crappies belong to the sunfish family. In Pennsylvania there are two species—the black crappie and the white crappie. The black crappie usually has 7 to 8 dorsal spines and the body is heavily speckled without any pattern. The white crappie usually has 6 dorsal spines and the body has spots arranged in vertical bands.

In this state, black crappies rarely stunt and are usually not found in such large numbers as are the white crappies. White crappies are found in great numbers in some reservoirs but seldom attain the large size which is found in the populations of black crappie. It has been found in Minnesota and in Pennsylvania, notably in the Pymatuning Reservoir, that large numbers of white crappies and dense populations of carp go hand in hand.



MERRY MONTH OF MAY is peak of crappie-catching season.

The length-weight relationship of crappies are shown in the following table:

TABLE I
BLACK CRAPPIE

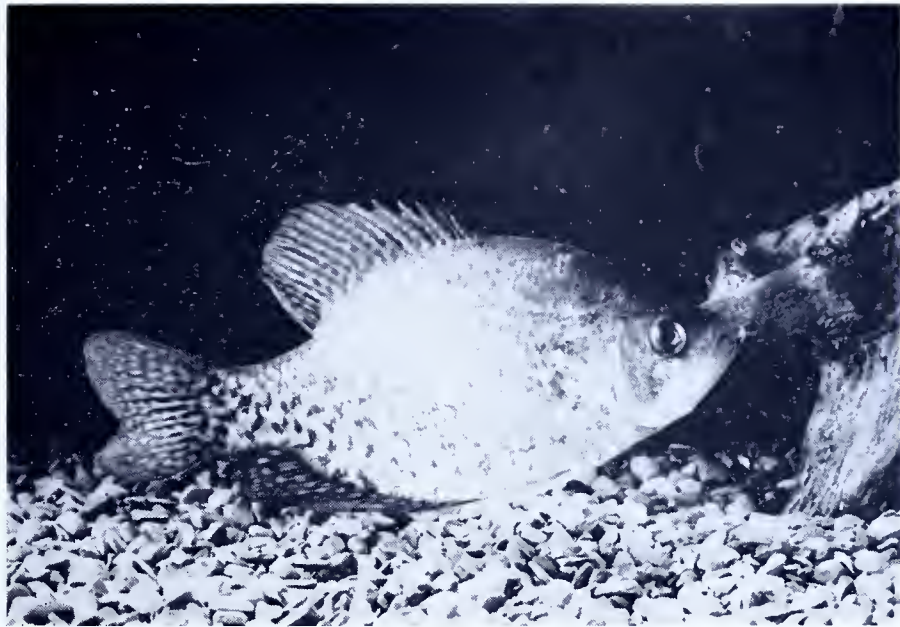
Number	Total Length (Inches)	Average Weight (Pounds)	Range in Weight (Pounds)
12	4	0.06	0.04-0.07
28	5	0.08	0.05-0.10
12	6	0.14	0.11-0.18
19	7	0.24	0.16-0.31
16	8	0.33	0.22-0.41
18	9	0.54	0.40-0.70
29	10	0.67	0.47-0.83
15	11	0.83	0.67-1.11
11	12	1.09	0.79-1.35
4	13	1.17	1.08-1.41
3	14	1.57	1.48-1.78

WHITE CRAPPIE

23	4	0.06	0.04-0.06
71	5	0.09	0.06-0.16
45	6	0.14	0.09-0.23
27	7	0.21	0.14-0.26
35	8	0.31	0.22-0.40
12	9	0.43	0.33-0.52
18	10	0.59	0.43-0.93
7	11	0.66	0.45-0.87
5	12	0.72	0.63-0.94
2	13	1.09	0.97-1.21

Although Table I does not include large numbers of fish, it can be seen that the black crappies have a tendency to grow faster than the white crappies.

If you can't wait for the game fish season to open on the lakes, try crappie fishing in the spring. All you need is some emerald shiners or fathead minnows and you are all set to catch the poor man's bass.



BLACK CRAPPIE, Pennsylvania's early spring panfish.

TABLE II
Average Calculated Total Length at Each Annulus for
Crappies in Pennsylvania

Growth of Black Crappie

Location and County	No. of Fish	Average Back Calculated Sizes at Age									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Bridgeport Dam											
Westmoreland County	31	1.1	2.1	3.3	4.4	4.5					
Lake Clark											
York County	28	3.7	8.5	9.0	12.2(1)°	13.2(1)°					
Lake Sheridan											
Lackawanna County	40	2.5	7.7	10.0	11.2	12.4(1)°					
Lake Wallenpaupack											
Pike & Wayne counties	31	1.3	3.8	7.6	10.0						
Raystown Dam											
Juniata County	43	3.0	6.0	8.4	10.5	12.2	13.7				
Average for Five Lakes	173	2.3	5.0	7.7	9.7	10.6	13.7				

Growth of White Crappie

Bridgeport Dam											
Westmoreland County	55	1.5	2.9	4.3	5.7	7.0	7.4(1)°	8.8(1)°			
Lake Clark											
York County	36	4.4	9.4	10.4	12.3(1)°	13.2(1)°					
Silver Lake											
Bucks County	112	1.0	1.9	2.9	4.1	5.2	6.0	6.8	8.1	9.2	10.6(2)°
Keystone Lake											
Westmoreland County	14	2.2	4.9	7.1							
Pymatuning Lake											
Crawford County	27	1.9	4.1	7.4	9.2	10.8	11.6	12.6(2)°			
Average for Five Lakes	244	2.2	4.6	6.4	7.8	9.0	8.3	9.4	8.1	9.2	10.6

*Number in parenthesis () is number of fish in this age group.

Life jacket or kapok filled cushion for each person in the boat is required by law in Pennsylvania. And from the standpoint of boating safety, the law is one of the best ever enacted. Accidents happen on the water as they do on land. Newspapers frequently carry stories about fishermen, boaters, many excellent swimmers, whose boats have capsized and who drowned in wild, rough lakes and rivers. Being properly equipped with a kapok or cork filled cushion or vest will prevent many of these tragedies. Though the life saving equipment may at first appear to be just excess baggage when so many other articles need to be taken along—motor, gasoline tank, anchor ropes, insect repellent, tackle box, rods, lunch, plus passengers to name a few—the life preserver may be the one factor determining a safe or disastrous event when the chips are really down.

However, owning this kapok equipment and carrying it afloat does not mean boatmen or fishermen are free to discard all safety precautions. Besides, depending on the equipment's condition, this intended life saving device sometimes fails. Soiled with gasoline or oil, or compressed while wet, the kapok article then often fails to support the weight of a person in the water. As one manufacturer of life jackets and cushions has emphasized, preservers are only as good as the care they have received.

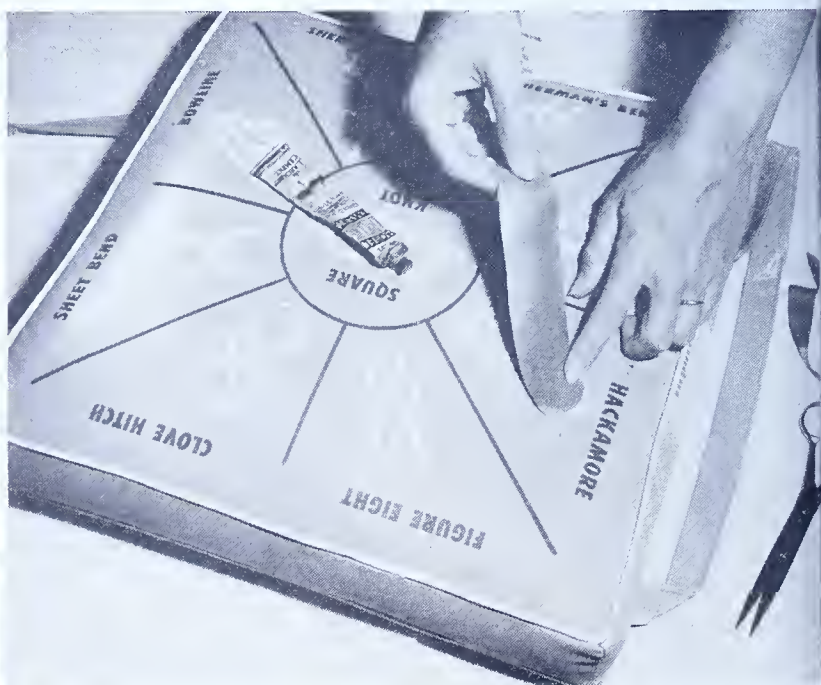
Let's look first at what constitutes a life preserver. Any

object that is buoyant enough to support a person in water, that is, buoy him to the surface, is considered a "life preserver." The object could be an empty five gallon jug, a log, an inverted bucket trapping air within, or an inflated balloon. Garments and boat cushions designed for this purpose are filled with balsa wood, cork, or kapok, a vegetable material that is more buoyant than cork and nearly as light in weight as a bushel basket filled with feathers. Roughly 20-ounces of this light, fluffy material is packed into an average boat cushion measuring 15 x 15 x 2-inches. The package is designed to support about 20 pounds of weight in the water, an amount prescribed in U.S. Coast Guard specifications.

Average sized individuals suspended in water weigh less than this amount. Tests show that a person is then only about 1/12th his actual weight, though this may vary with the individual's specific gravity. One twelfth of the weight of a man who normally tips the scales at 180 would be 15 pounds, a figure which the 20-ounces of kapok will support very nicely. Thus, it is important to purchase the proper size garment. Those designed to sup-



LIFE PRESERVERS should be among first articles placed in a boat and handled carefully.



PATCH 'EM UP if they tear. Torn plastic covers can be repaired by cementing a similar patch of material over damaged area to keep it water tight.

Life Preserver.....

port the weight of a child in water will not support the weight of a husky adult. Then too, how long a time it remains in life-saving condition depends on the type of care given to it both while in storage at home and while boating.

Highly damaging to kapok are oil and gasoline that are spilled accidentally upon it. These petroleum products damage the kapok's buoyant qualities. Should these be spilled upon a cloth covered vest or cushion, while refueling the motor, they must be washed or wiped off immediately before they have had time to penetrate through the material. Vests and boat cushions covered with plastic or plastic impregnated materials escape this damage, providing the covering is free of holes and tears.

Both types of coverings sometime tear either from age or by rubbing across a nail or other sharply pointed metal object. Holes should be patched as soon as discovered. Otherwise, the kapok fibers within will become wet through exposure to a heavy downpour of rain, fog or through actual submersion in water. Kapok becomes less buoyant after it has been wet several times and crushed.

The material gets its buoyancy from the air cells trapped between the fibers and when this fiber is broken and destroyed by sitting upon it after it has been wet, the buoyancy will diminish considerably.

A preserver that is wet inside should be hung in the warm sunlight and preferably in some breezy area until thoroughly dry. Sunlight or artificial heat of room temperature will not damage the fibers, but they are not fireproof. And unless the kapok garment is dry before being placed in storage, mildew will set in to damage the article as this fungi does to so many leather, cloth and paper materials. Store the life preserver in a warm, dry place; never in a damp basement or on a wet boat floor.

It is a wise move by some states to enact laws compelling water-minded sportsmen to carry this important boating accessory. But equally important is giving the kapok filled vest or cushion careful attention so that its life-saving qualities can be relied upon should an accident happen while angling or boating. Life is worth far more than the little effort expended in keeping this piece of fishing gear in "ship-shape."



FAMILY FUN DAY BEGINS . . . boating, skin diving, skiing, picnicking . . . and we always have those LIFE PRESERVERS ABOARD for safety!



GAS AND OIL penetrate into the preserver causing it to loose much of its efficiency during an emergency. To keep a vest clean and "wearable" brush all mud and dirt from garment regularly, air them thoroughly.

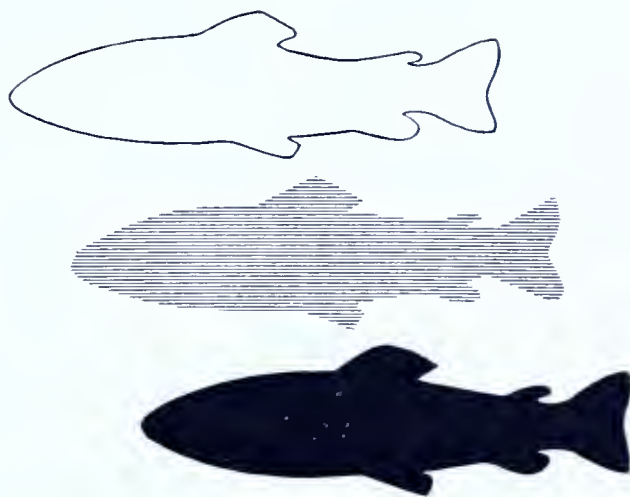


The **COMMODORE PERRY**, Department of Fisheries' steam tug of 1908.

Yesterday

The **COMMODORE PERRY** . . . a name not new to Erie waters, was the Department of Fisheries patrol boat, christened and launched April 21, 1908. She was 71 feet long with a 14-foot beam with a speed of 11 miles per hour and cost \$5,885. The need for a staunch sea going boat for fishery work on Lake Erie was felt from the very beginning of the Department, both as a medium to enforce the fish laws on the lake within the jurisdiction of Pennsylvania and for the fish cultural work. It was reported that although only a few months in commission service, the Commodore Perry had already performed valuable work. Illegal fishing in the lake was entirely broken up and licensed fishermen received a perfect protection which never before could be given them. The boat in 1908 was considered indispensable. The cost of operating it could only be estimated and thought to be about \$3,000. According to the report this amount was short by several hundred dollars and it became impossible to operate the craft in the spring and therefore put out of commission until June.





Today

The PERCA . . . the Fish Commission's modern power boat was commissioned and launched on October 10, 1959. A cabin cruiser, 42 feet long, 14 feet wide with a draft of 3 feet. Top speed is about 13 knots, carries all latest gear and equipment, including radio telephone, sonar set, fathometer, double drum winch plus other facilities. Like its early ancestor, the Commodore Perry, it is used for research activities of the Commission in Lake Erie waters; for patrolling, inspection of commercial fishing boats and equipment, apprehension of improperly licensed craft and assists the Pennsylvania Department of Health in pollution inspection and surveys.



Johnny Nicklas Photograph, Pa. Fish Comm.

The PERCA on speed trial runs on Lake Erie waters.





TYING THE PALMER . . . Body bulk made with black cotton floss.



PEACOCK HERL is wound on over floss and body is completed.

if at last you don't succeed _____

_____ *Try Palmers*

■ Even before describing a “palmer,” this is another success story and like many, chance and luck played prominent roles. Besides, without success there would be no story. And were I to feel that more than a few would follow through and wear out—for palmers, that is—the streams I frequent, I’d keep the whole thing to myself. Things are tough enough.

I was introduced to the fly some thirty years ago by Elmer Kibler, a Pennsylvania Dutchman whose mother was part Indian. He was an “old timer” among a small group of expert trout fishermen I knew and one of my fishing preceptors. He since passed on to the “happy hunting grounds” of his mother’s people.

The name “palmer” was one he reserved for a pattern of his own fabrication—a fly he pressed into service only on occasions that will be disclosed later. Asked where he got it, his reply was, “Ich weischt nicht” (Pennsylvania Dutch, which translated means, “I know not.”)

I knew that was not the truth, but it was his way of dismissing the point. It probably was handed down to him

by Bob Glover

by his dad, who was a real woodsman. The family homestead was ’way back in, along Mud Run in Pennsylvania’s Carbon County. In that country, and in those days, if one didn’t know how to supplant the family larder from the surrounding woods and streams he and his would have been a hungry lot on many occasions.

Actually, a palmer is a caterpillar by another name. Among fishermen, still others are “woolybear” and “woolyworm.”

In fact, the woollyworm is a so-called fly pattern that has just risen to prominence in recent years. But Elmer’s palmer bears little resemblance to the animal that develops into a destructive fruit moth or the fuzzy replica that came to the fore a few years ago.

The palmer is tied on a #6 hook, differing only from



THREE TURNS of Plymouth Rock hen cape hackle, spiral-wound and you have a gray palmer.



WET PALMER, with soft hackles clinging to the body, as trout see it. Though un-pretty to the human eye, as most bugs are, it's a tempting morsel for trout.

the construction of the standard #12 or #14 size wet fly in that the body is built up with cotton floss to add bulk. Also, the hackle is spiralled three turns over the entire length, rather than just at the forefront of the body.

For the further edification of the tie-your-own gentry, peacock herl is the material common to the body of the two patterns I use. My gray palmer is adorned with hackle from a Plymouth Rock hen. The brown palmer is dressed with a hackle from a Rhode Island Red hen. Hackles from the capes of hens are preferred as they are soft and undulate close to the body as the fly is moved through the water.

Building up the flies' bodies with floss serves a purpose other than bulk. Being very absorbent, it soaks rapidly. The fly thus sinks quickly and deep, where generally it must be fished for best results.

Actually, not too many of the standard patterns lend themselves to this palmer-type dressing. In any event, I'm not thoroughly convinced that pattern or even color have very much to do with the result. Nor have I tried very hard to find out, because the conviction dawned on me long ago that fish do not subscribe to the books I read or to the logic I apply.

So, when the going astream gets tough, I run the gamut of accepted practices, then draw upon the imagination and, on rare occasions, with startling results. But when nothing happens, I call it a day and mark off the session to fresh air, exercise and casting practice.

That was what I was about to do on one of those dry runs some seasons back on the Tunkhannock Creek in the Poconos Mountains of eastern Pennsylvania, when, as a final gesture, a pair of palmers replaced the last resort of the streamer department. All the possibilities of the wet

and dry fly boxes had been exhausted earlier. And I was just about exhausted too.

Ordinarily, though I take my fishing seriously, I take it leisurely. But on this occasion, I had broken a rule of long standing and promised a particularly irritating skeptic a mess of trout. And of all days to give me a hard time, the creatures picked this session. So the leisurely approach had been abandoned early.

If you have ever stayed at it until your backbone felt as though wedges were driven between each vertebrae, until your legs ached from bracing the current, until your arms tingled right to the fingertips, and until your eyes fairly bulged after seeking out every likely eddy, backwater and slip, you have an idea how bushed I was.

As it turned out, however, the condition was a blessing. Had I been a bit fresher and keener of mind, there would have been more likelihood of offering my license as a lure. Palmers at that moment was really flaunting the book. Later in the season and after dark, when the larger insects are abroad, the palmer is tops, it says. But in the brilliance of a mid-May afternoon, on a crystal clear and lower than normal mountain stream—never.

Anyhow, they were on. And I remember thinking that if anyone got too close, I could accidentally send my back cast into the trees and save the embarrassment of explaining away the monstrosities. On that thought, I was set for the final fling.

The first cast was extended to a pocket from which several trout had been taken on earlier trips. Almost immediately one darted from the depth and I connected. Summarily a gleaming brownie stretching to twelve and one-half inches was slipped into the creel.

With a little more care and respect, a second cast was

made. And though the flies were carried further into the pool, the result was the same. A twin to the first was creeled.

Moving to the next pool, again, the first cast got action. This time, however, it happened as the flies were being lifted from the water at the end of the drift. The trout proved to be a heavy fourteen inch rainbow and hit in a manner which up until that time I had rarely seen. It cleared the water and took the fly on the way down. Another struck the same way that day and the experience has been enjoyed numerous times since, a-la-palmer.

In about twenty busy minutes after the palmers were bent to the leader I had four nice fish and gave in to the urge to experiment. A switch to the same color combination in standard wet flies netted exactly nothing. I waded ashore, changed back to the palmers, re-entered the head of the pool and retraced the course. By the time it was worked, another fine brace was netted but released. The same procedure in two more pools produced similar results.

Though the action served to drain all the tiredness from me, I had to get home, so the fifth, the limit I set for myself that day, was creeled. They were hastily drawn, then I headed back to my car.

Nor did I dis-assemble any tackle on the way. I wanted somebody to see those flies. I wanted some "expert" to tell me I'd never catch anything with them. On the way, it happened three times. They all reacted just as I would have, had I seen someone sport such veritable feather dusters on the business end of a trout lash-up.

Back at the parking area a fourth and another fishless cohort had just started to rack up. The usual question was directed my way. And when I replied—casual-like, of course—that I caught five, he started to lament on the dearth of fish in the stream, then, in a real double take, stopped midway in his sentence. He repeated as a question, what he thought I said, but was sure I had not.

In answer, I spilled the contents of my creel. He kind of floated across the space between his ear and those five trout. Meanwhile, I went about the business of shedding.

By the time brogues and waders were stowed, he had the story, and also a good look at the palmers. The manner in which he examined them indicated they were something new to him. So, instead of returning them to the fly box, they were offered to him. Nor did he express even a polite refusal. As I pulled out, he was on his way back to the stream.

Late that evening my telephone rang and I got his report. "Six trout." In the process, however, he lost one of the flies, and the second unraveled completely as he took the sixth. At that point his fishing for the day came to an end.

Would I please tell him where he could get a dozen more like the two I gave him? And price was no object. I told him they cost \$5.00 apiece and the guy who tied them was in jail. He only reply was, "What jail?" Anyhow, he got his flies.

Sure, they have failed on occasion. Palmers are not the panacea for all troutless days. There is no such thing yet or if there is, I hope the guy who has it dies with his secret. Nevertheless, they are a good thing to have on hand, but I'll not press the point further. As I said before, things are tough enough.

East Fork-Sinnemahoning: A Trout Stream Profile

The ideal trout stream, it has been said, is Nameless River, and exists only in the pipe-dreams of winterbound anglers. For my own part, I have done a lot of looking for it.

I have waded the famed chalk streams of England, the Dove and the Itchen, where the art of fly fishing was first developed. I have risen trout in the Truckee and the Gunnison, in the shadows of the Rockies, where the snow-water flows constant, even in mid-summer.

I have cast a lot of water in a lot of places. Yet consistently I find myself being drawn back to a singularly undistinguished little valley stream in northcentral Pennsylvania.

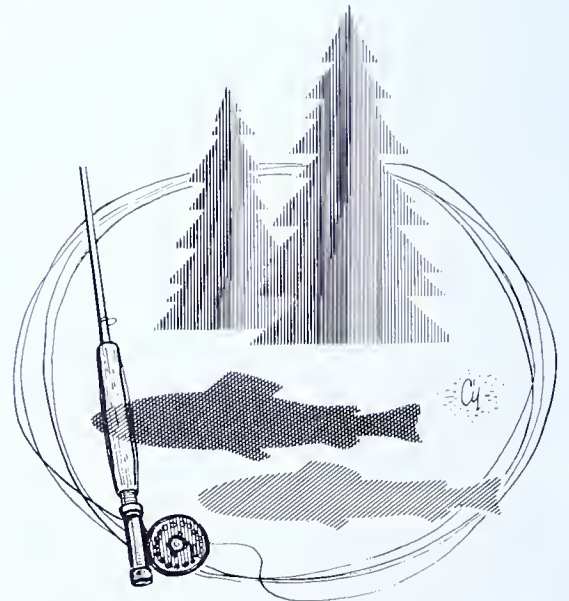
The East Fork of Sinnemahoning Creek, in Potter County, Pa., has never to my knowledge been written up as a great trout stream. So far as I know, neither George L. M. La Branch nor Theodore Gordon nor any of the great fishermen ever cast it.

It cannot boast the tremendous fly hatches of the marvelous "down East" limestone streams. I don't think it has ever produced a record trout. But for those who get to know it, the East Fork is a perfect jewel of a trout stream.

The East Fork is a tributary of the First Fork of Sinnemahoning Creek, itself a dandy piece of trout water. First Fork rises from a thousand mountain springs and brookheads in the Bucktail Ranges of central Potter County. By the time it gets to Wharton, where East Fork comes in, it is a small river, a brawling stretch of water with all the fly fishing potential an angler could ever wish for.

But by virtue of its bigness, First Fork is not the kind of a stream you can grow to love. Completely unpredictable, it is a tough piece of water to come to grips with. It spurns affection. It offers no easy intimacy. First Fork may have as many moods as the mountains; but East Fork is ever the seductress.

East Fork, above the confluence, is a lovely lady dane-



ng sunlit and sparkling down soft meadows and spreading over sandy-bottom pools in shaded piney thickets. She takes on water well, has a fast runoff, and holds up good in the dry spells. On the headwaters the native brook trout and streambred brownies race one another for your dry fly.

This stream rises from an elevation of 2,200 feet a half-mile southwest of the Coudersport-Jersey Shore Road, which straddles the divide between the Pine Creek (West Branch) and First Fork watersheds. From source to mouth it has a run of 20 miles, of which all but the first two miles are paralleled by the East Fork Road.

Roughly half the size of First Fork, East Fork varies in width from five to eight feet at Camp Run, the midway point, to approximately eighteen feet at the mouth. There are stretches of swift water but no waterfalls and rapids, the total drop being only 1,200 feet over the entire 20 miles.

Delicate and clear, East Fork meanders in places down the center of the valley, aspen and willow hung, but more often prefers the deeper shade of the mountainside which it brushingly caresses with the liquid softness of a woman's cheek.

Altogether, in the variety of water, trout, and fishing, East Fork has everything an angler might wish for. There is virtually no posted water. And except for opening weekends, it's rarely crowded. In fact, after June 1st, you may have miles and miles of lovely water all to yourself.

Throughout its entire 20 miles, East Fork is consistently good during at least the first two months of the season with the edge, if any, going to the lower water. There is some upstream movement of trout as the fly hatches progress from the mouth to the upper reaches. But the real migration, which includes trout moving in from First Fork, takes place in mid-May, usually after the stream rises from a rain.

By early June, East Fork can be divided into three distinct zones, based on prevailing water temperatures.

The lower seven miles, from Wharton to Fuzzy's place, is mostly big trout water, with occasional smaller trout in the well aerated riffles and cold zones. Maximum water temperatures on this section may reach 80°, although deep-shaded sections run cooler. There are also springholes, deep pools, and tributary inlets where the trout can cool off.

From Fuzzy's place to Conrad, a distance of eight miles, you come upon the best of the brown trout water. With a temperature range from 55° to 72° in mid-summer, this is excellent holding water. Practically every sizeable pool having an undercut bank, upended tree root, or other hiding places can be depended upon to contain trout from 12 to 27 inches.

This same section, incidentally, is a natural spawning area. When seining minnows in the Jamison Run stretch you must be careful what you toss into your minnow pail, for you are nearly certain to scoop up some fingerling brown trout.

Above Conrad, the water temperature rarely exceeds 65° and here you begin picking up more and more brook trout, and fewer browns. Occasional browns, including some real lunkers, persist in the East Fork right up to the beaver dams above Camp Beaver. But, generally speaking, Conrad marks the upper limits of the best brown trout sections and the beginning of the brook trout water.

The upper East Fork and its tributaries, of which Birch Run is the best, have sizeable populations of native brook trout. By sizeable I refer to numbers, not lengths. They seldom go over nine inches. But they rise nicely to the dry fly and make up in beauty what they lack in inches.

East Fork is also liberally stocked with hatchery brookies by the Fish Commission including many thousands annually from the rearing ponds maintained at Wharton and Marvin Run by the East Fork Sportsmen. Some of these pond-reared brookies go to a foot in length.

Among the tributaries, Birch Run, located five miles east of Wharton, toward Cherry Springs, has three miles of water and is good right up to the source. Wild Boy Run which comes in at Conrad is a tiny, rocky brook so narrow you can step across it. But you can take brook trout from it if you creep up on them.

Jamison Run, two miles below Conrad, offers two miles of native brookie water. At Camp Bennett, Gravel Lick comes in small but with occasional pools and rock-sheltered pockets. The East Fork itself has brookies right up to the mossy meadow where the water first seeps up at the V of two hollows, two miles up the East Fork trail.

During the first weeks of trout season you will encounter periodic hatches, mostly of Little Black Stoneflies, ranging from sparse to fairly heavy. These flies provide the best of the early season fly fishing, and continue on the water until mid-May. They are best imitated by the No. 16 or 18 Blue Dun.

Water temperatures during the opening weeks range between 40° and 55°, with the hatches commencing invariably between 49° and 52°. Practically all of your trout will be 8 to 11 inch browns and brookies. And nine out of ten of them will be hatchery releases.

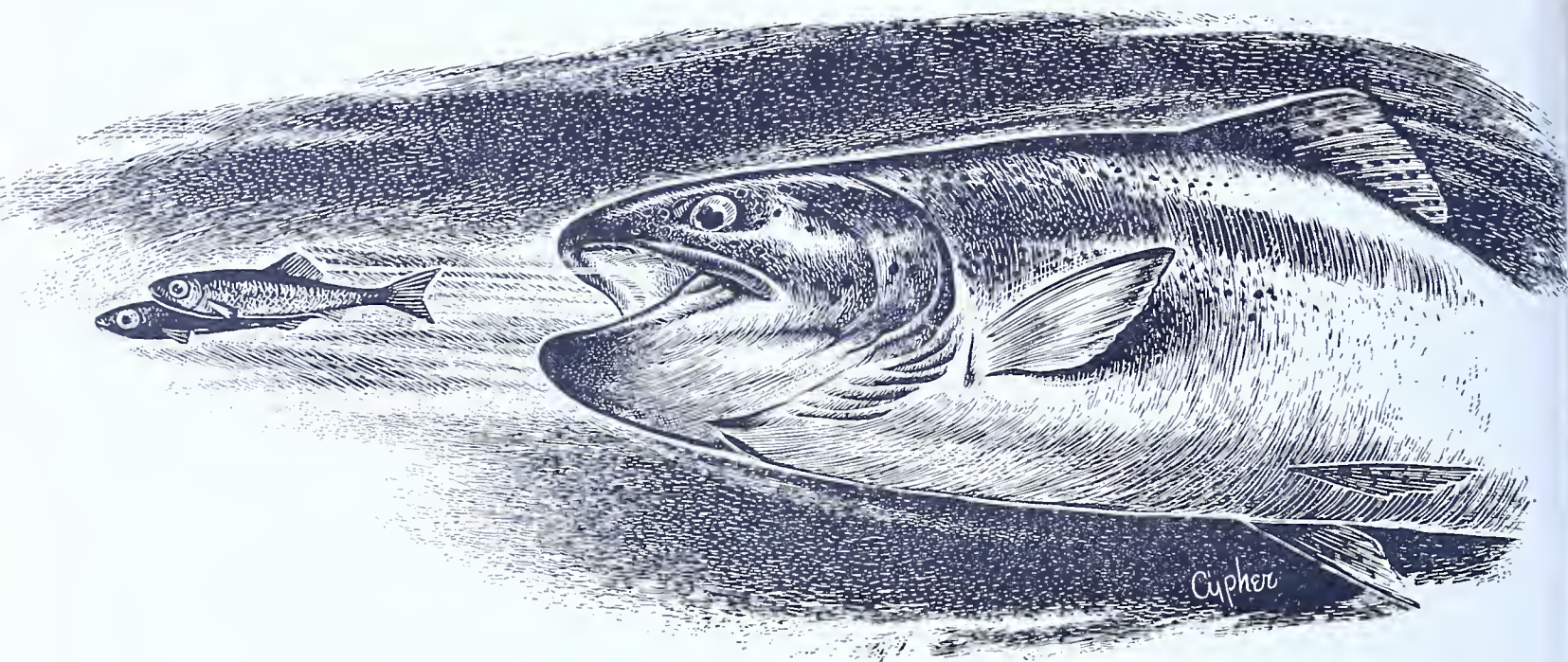
As the season advances, these stocked trout become thinned out, more noticeably so in the East Fork than on the First Fork, which has more water and less rod pressure per mile. Both streams receive in-season trout plantings from both State and Federal hatcheries. These in-season releases provide intense, concentrated action at the truck stops but have little lasting effect.

During the first couple weeks, unless it's too bright and sunny, you can expect a hatch to come off between 10 and 11 a.m., and periodic hatches during the day. In May there is frequently a morning hatch between 9 and 11 a.m., and an evening hatch between 5 and 8 p.m. In June the morning hatch diminishes in importance and the evening rise comes into its own.

The spectacular hatch of Mayfly drakes reaches its peak on the East Fork about the first week in June, but is vastly overrated so far as fishing results are concerned. That's because the hatch is heaviest on the lower water while many of the trout have already moved on upstream.

In a normal season the best fly hatches are on the mid two weeks of May, when the caddis, stoneflies, march browns, little may, evening duns and beaverkills are on the water. In both wets and dries, the favorite patterns and sizes are: Ginger Quill, Quill Gordon, Dark and Light Cahill, Blue Dun, Iron Blue Dun, Stonefly and Beaverkill (#12, 14 and 16); Lady Beaverkill and March Brown (#16 and 18); and Midges (#18, 20 and 22).

As for leaders, a 3X to 5X will get you by in early season, but be prepared to go to 6X for dry fly work



when the water goes low and clear. For after-dark wet fly fishing I'd recommend nothing lighter than 4X. Many of the local fishermen use an 8-foot piece of 8-pound monofilament and trail a string of three wet flies.

On hot, dark, moonless nights of June and July, most of the sizeable streambred brown trout are taken by night fishing. In fact, it is practically the only way they are taken consistently at any time. The favorite fly is the Coachman. But any big-bodied wet fly, size 4 or 6, with a piece of white feather on it, will do the job.

During the hot summer months you will also find good daytime fly fishing on the upper East Fork, with brook trout furnishing most of the action. The stream is densely shaded over much of the upper water. You will pick up occasional streambred brown trout along these same upper stretches.

Among the many trout waters of northcentral Pennsylvania, East Fork rates highly with the local fisherman. During early season, many of them sit back and let the tourists and city anglers have their day. But come June, when they take down their rods, East Fork is one of the streams they head for.

As freestone streams go, East Fork goes a long way, both literally and figuratively. It is hemmed in by some spectacularly wild and beautiful country, and its quiet pools and shaded riffles are a joy to cast. It offers the kind of leisurely fishing you are sure to enjoy. It will not disappoint.

—Jim Hayes

★

I shall next give you some other directions for fly-fishing. First, let your rod be light and very gentle. I take the best to be of two pieces. And let not your line exceed—especially for three or four links next to the hook—three or four hairs at the most, though you may fish a little stronger above in the upper part of your line. But if you can attain to angle with one hair, you shall have more rises and catch more fish.—Izaak Walton

★

Flies for Difficult Situations

It has never been safe to bet that trout will rise no matter how promising the day, the stream or how plentiful the trout population. When they are rising regularly, the skilled angler seldom has difficulty. It is the odd situation when they splash at his offerings or refuse to rise at all that challenges his skill and removes trout from the realm of an exact science and places it in the arts. Many experienced anglers are so adept at improvising they frequently find a simple solution to difficult problems. Whether it is a special pattern or a special method of presentation they seem to be able to coax reluctant trout into striking.

At the beginning of a hatch, trout take the fly at the surface, just as it emerges from its nymph shuck. Many anglers are fooled into fishing a high riding dry only to have it ignored. The solution is to present a nymph imitation at or just under the surface.

These imitations must be somber in color and tied to float against the traditional method of tying a nymph to sink. One way of accomplishing this float is to tie a body of deer hair, clip it into shape, then overlay it with raffia or silk. The back can be colored with brown lacquer although I doubt that it adds to the taking qualities of the fly. This fly will float at the surface and is a good taker. It has one drawback from the angler's standpoint. It is hard to see among the lights and shadows of the water. Fish many times take this imitation so gently that unless the angler is alert the strike may come without the angler being aware of it.

A different approach helps to solve the problem for eyes that are no longer young. A spider fly is tied with an elongated tapered body that resembles a nymph. Use a hackle that is somewhat softer than that generally used on a dry. When the fly is dressed the hackle on the underside of the fly are wet and stroked back along the body. The top hackle are treated to float and as the fly lies awash at the surface the hackle extends above and helps

the angler follow the float. It is a good imitation of a hatching fly.

A utility fly of this type is tied with a muskrat fur body, woodcock flank tail and a hackle of ginger, dyed blue-grey. Several variations can be constructed according to the angler's preference. Occasionally the hackle is clipped from the underside of the fly when an especially sparse tie is indicated.

When the trout are feeding on midges the angler, sometimes, has difficulty. A tiny wet fly that matches the natural will sometimes take fish as will a large spider. Another wet-dry pattern is much more effective than the above mentioned patterns.

The Teal and Red was originally an English sea-trout pattern and tied in the largest sizes. A variation, tied on eighteen and twenty hooks, is very killing. The wings are of teal, tied so as to point toward the eye of the hook at about a forty-five degree angle. They are stubbed short. The body is made with about three turns of red silk at the bend of the hook then peacock herl shoulders. The hackle is either brown or black. The wings are dressed with floatant while the rest of the fly is wet. The body breaks through the surface and the fly rides in a vertical position with the bend of the hook below the surface.

The larva of the midge is a tiny red worm less than a quarter inch in length that lives in a slime tube on the stream bed. When about to hatch the thorax enlarges and turns dark. Gasses gather in the enlargement causing it to float to the surface then the fly emerges. This transformation takes place in still water where trout seek them out. The teal wings on the imitation allows the angler to see the floating artificial. When the trout are feeding on midges this pattern is especially effective although they will at times take any small dark pattern.

When the green inch worms drop from the foliage in late summer, trout often feed on them to the exclusion of all other food. At times their stomachs are distended until they become almost transparent. The worms swing down from the trees on silken threads that sometimes break causing the worm to strike the water with some commotion. Cast the imitation so that it strikes the surface with a decided splat and trout will respond readily.

One of the simplest imitations is made with a lemon wool body, ribbed with black horse hair. The hackle is a few strands of guinea feather clipped short. Another is made of deer hair clipped short. The hair is dyed green and ribbed with peacock quill. This imitation has the added advantage of floating indefinitely.

I once took a nice brown by casting the fly over a projecting hemlock tip and allowing the imitation to dangle just above the water. It hung there for possibly ten seconds before the fish rose. The vigor of the strike was forceful to say the least.

The first imitation will take nice trout if it is fished deep during the early part of the season when the trout are hunting caddis worms. Tied with a weighted body and fished with a slow drift it is a deadly addition to the angler's bag of tricks.

There comes a time when twilight deepens into dark that ordinary artificials elude the keenest vision. It is well to have a half dozen clipped deer hair bugs of the type usually tied for bass and a pair of heavy droppers on a wet fly leader. Attach a pair of bugs, do an about face and

cast down and across the nearest pool. When the current ceases to tug, drag them slowly up toward you and repeat. Be ready, . . . a big brown can hit you with a jolt that will test both your arm and your tackle.

Another fly that has gained a wide reputation as a taker of fish when conditions are difficult is the muskrat fur nymph. It is simple to construct. The tail is a couple of hackle fibers, the body of blue-gray fur thickened at the shoulders, the hackle is of either brown, blue-gray or guinea. Occasionally it is ribbed with either silver or gold wire. A local tyer discovered its fishtaking qualities many years ago. It gained quite a local reputation then seemed effective wherever it was tried. When asked what he named it the tyer, a local hillbilly, replied, "Its a Jinking Bug." "I tied it when I was just jinkin' around."

It will take fish either when drifted deep or when dressed to float at the surface. It will sometimes prove outstanding when fished at the surface at the beginning of the Shadfly hatch. One of the still water methods that sometimes takes trout of large size is to cast it into a deep pool and allow it to sink. It is then brought to the surface with a series of twitches. Big trout follow it to the surface and take it just as the fly is about to be lifted for another cast. This is a method that requires time and patience but the rewards are tremendous especially at the beginning of a hatch.

Another combination that sometimes saves the angler from a blank day is the nymph—streamer combination. The streamer is attached to the leader point with a nymph on a dropper some distance above. I'm guessing but it seems to me that the trout, not interested enough to take food, sees what he figures is a minnow following a choice morsel moved by greed to get it first. The result is satisfactory to the angler no matter what the motive.

Another combination that seems somewhat paradoxical is the sparsely tied spider used with a weighted streamer, or weighted nymph. This is the combination to try on summer afternoons on deep shaded pools when an occasional crane fly hovers over the water. The leader should be long and as fine as possible. Cast the flies and with a high rod, hold the spider above the surface. By manipulating the rod the spider can be made to dance above the surface in imitation of its crane fly counterpart. Strikes come with explosive suddenness that delight even a veteran angler.

For those who like to be astram the warm afternoons of late season and test their skill at the game of fine and far fishing it is hard to beat a sparsely tied spider. One of my favorite patterns is tied on a short-shanked 16. The body is about a half dozen turns of black ostrich herl with three or four turns of stiff black spade hackle. The fly size is the diameter of a quarter and it lies on the water its hackle parallel to the surface rather than at right angles. Fished close to the banks in the dark shaded pools it will sometimes give a delightful afternoon of sport when the stream is vacated by other anglers. Other spiders that are takers are the blue-gray, brown and badger with a peacock body.

The angler must learn to cope with conditions that are often other than ideal. To trick an old veteran trout that has withstood the battery of lures and baits that has already passed his lair day after day, after day, is an achievement that can bring much angling content.

—Albert G. Shimmel

Trout in the Rain



*The air is like a butterfly
With frail blue wings.
The happy earth looks at the sky
And sings.*

—Joyce Kilmer

In the many hours that I devote reading outdoor literature I am often discouraged to find a lack of good informative information on the sport of trout fishing. What articles that are written seem to sketch over or miss a period in stream fishing when even the poorest angler can take trout. Possibly this oversight is intentional as a dyed in the wool troutman might hold this as a treasured secret not to be disclosed under penalty of having his hackles trimmed.

Summer rains are, to many of us, a hinderance to a day to be enjoyed. But take note. If your day was spoiled by being dampened you may be in time for some of the finest trout fishing you may ever enjoy. The rain that pelts down on you often rings a dinner bell for feeding trout. You might start fishing your stream and the water is clear. The bewitching hour really begins when the color of the water starts to change. From this point on you may be in line for your once timid trout to turn into a ravenous feeder. The spell won't last long, maybe an hour or less, but in this small period of feeding on the rise of the stream you will find trout hitting in almost every riffle, pool, deep run hole, and spots where before you haven't taken a trout. This feeding period is often so potent even the big trout are caught off-guard stuffing themselves.

Don't be mislead though, the stream rise usually only takes place when a stream is clear and running normally. Your timing must be exact. The only sure way to predict the rise is by being there on the stream when it commenees to rain.

Another factor to consider is the force of the rain; if it is a steady fall the rise will start about an hour after it began; if the rain is a hard downfall look for the rise about 20 to 30 minutes after it started. Don't be too unhappy if you fail to hit the rise. In my many years of fishing I often cannot predict the exact timing even with the help of my stream notes I write each time I fish.

If the area you are going to fish has had a continual rain and the stream is discolored, don't expect a rise. It has already happened. Just put a minnow or nightcrawler on your hook and fish for the feeding trout still in search of food. Fishing any roily water for best results as all anglers know, use live bait. Fish are smelling their food rather than seeing it. If you are a purist use a larger spinner and fish it slow through the water giving the trout, with poor visibility, a chance to see the lure. Take about a dozen casts instead of one or two as this will enable your fish to be more easily caught should you miss him on your previous cast.

To give you an example of the stream rise here are some notes written on June 12th 1960, on Sugar Creek in Venango County: "Started raining early this morning around 4 a.m. Got on stream at 8 a.m. Fished upstream and had fantastic luck. Had trout on in every pool, riffle, pocket. Water was slightly dirty. Kept three trout 14" to 17". Later in day fished same water raised not one single trout, water chocolate brown. Used spinner." Those are actual notes taken by myself during that day when I hit the stream rise just right.

You too can enjoy a day of trouting in the rain that will long remain in your memory if only you try this method.

—Gerald C. Blinzley

Poolhogs

Heads of pools are good places to snag large trout. The largest trout occupies the best hiding-feeding place which is usually at head or very near the head of the pool. The big boy is first in line in the food lane. He lies close up under protection of the fast tumbling mass of water, and his water is comfortably aerated. Very few anglers fish the head of a pool. They usually fish too far below and often stand where they should fish.

Tails of pools are the next hottest spots as living quarters of large trout. If there is no fairly deep water at the head of the pool the largest trout will be at tail of pool, in the dead-water area just in front of a large boulder where the water breaks out of the pool. It's a very exciting experience to snag a husky trout about rod-length away and tumble him over lip of the pool for a splashy tussle in the riffles below. These trout always seem extra-mad, determined to escape; because they see you standing below in the riffles as soon as they start dashing out so fast for the lure they cannot avoid being hooked. The lure is dapped about three feet upstream so the trout can easily see it from their hiding places back under edge of a boulder. Three feet of 3X monofil line is used for a dapping leader and only the lure is allowed to touch the water.

Head-tail tactics are especially effective on crowded streams. While crowded-stream conditions usually bring forth the best in human nature, there are some glaring

exceptions like the goosestepping poolhogs.

The poolhogs contrived to always arrive ahead of everyone. One of them would take a casting position at head of the pool. The partner would be below with just sufficient clearance for a backcast, and so their lines would not become entangled.

After a long, patient wait for them to fish the pool we would start for other water. Then the poolhogs would move, in unison, step by step, down the pool. If we turned and started back to the vacated head of the pool they would doublequick back to their original positions, so fishing room at head of the pool would be eliminated.

After taking a trout from tail of the pool we would feint movement downstream, and while the poolhogs hurriedly advanced to the tail hotspot we quickly circled back to head of the pool. We did not drown the poolhogs, nor even sever formal diplomatic relations. During our encounters the poolhogs never caught a trout. Undoubtedly, concentration on their maneuvers accounted for their empty creels.

Needless to say there was not the slightest desire to learn the names of the poolhogs. However one was a chain-smoker. During the last encounter we snagged a large trout at head of the pool. The smoker lighted a fresh cigarette, moved up to sit on a boulder and watch the play. As the trout was beached he lit another cigarette, arose, called despondently to partner—"We might as well go."

—Art Clark

Little Streams For Big Browns

Maybe I can help you find some big browns. I can if you know of one or more of those small, slow flowing meadow streams that winds its way leisurely through meadows, cow pastures and brushy woodlots. Such a stream is sure to have many log-jams, cut-under banks, holes washed out under tree roots and stumps. Also there will be long, deep pools, separated by shallow riffles over which water might not flow during a hot dry August.

The long, still pools should be full of crawfish, chubs and minnows. Muskrats have dug holes in the bank. And if there is a log-jam, a cut-under bank, or any place for a big brown to hide, you can almost bet one has taken up housekeeping there. The stream isn't stocked. It would be hardly suitable for hatchery raised trout and only a stream-wise brown could exist there. The average fisherman visits this stream only to get crawfish and minnows for bait.

I know of a dozen such streams in this section, and fish them all with surprising results. The one I am going to describe to you is my favorite; it's Halfmoon Run in Centre County. It's only ten or fifteen miles long from springs that flow off Bald Eagle Ridge where it originates to where it empties into Spruce Creek, one of the best brown trout streams in this section, that empties into the Juniata River, also with its share of big browns.

That's one very necessary requirement: your brook must flow into a stream, lake or pond stocked with brown trout. Browns, like most all other trout, often go up these small streams to spawn. After the spawning period, the

big brown finds conditions so much to his liking, probably lured by more favorite food than he ever saw before; (crawfish, chubs and minnows) and so easy to catch. He's reluctant to leave, he takes up his abode and stakes out a claim.

He prefers a pool that has an over-hanging bank, probably one with a spring under it. But he'll settle for a log-jam, tree or stump that has been washed out underneath, the spillway of a dam, or even a big muskrat hole, anyplace he can hide that will help him keep cool. He seldom leaves there as long as the feed holds out and then only at high-water. Come June, you can easily tell where one is or has been, by the scarcity of chubs and crawfish. It's now that he's a sucker for a minnow, although anytime's the time if you present it to him the right way. And why not? It's on his menu the year round, his main food supply. Oh, I know he eats a lot of worms, and night crawlers when the spring rains wash them into the streams by the millions. Then later in the season he'll eat a lot of nymphs and flies but did anyone ever try to figure out how many nymphs and flies it would take to fill a twenty-inch brown? (see bottom next page)



51,000 Acre Quehanna (Curtiss Wright) Area Open To Public Fishing — June 1, 1961

More than 40 miles of Commonwealth trout streams located within the boundaries of the Curtiss Wright Corporation's Quehanna site, will be opened for public trout fishing June 1, 1961, according to an announcement by Albert M. Day, executive director of the Pennsylvania Fish Commission.

Day said that Commissioner Albert R. Hinkle, Jr., of Clearfield, and others, had been negotiating with the Curtiss Wright organization for some time to make it possible for state anglers to enjoy the fishing in the Quehanna area, which is located in Clearfield, Cameron and Elk Counties. "The 51,000 acre area contains some of the finest pure and clean trout waters in Northcentral Pennsylvania," said Day.

"Mosquito Creek, Pebble and Beaver Runs flow through the area. Parts of Mix, Red, Page and Wykoff Runs, as well as Upper and Lower Three Runs also flow through the industrial reservation. Arrangements for the opening of the area for public fishing were negotiated with Howard M. Lane, chief security ranger," said Day.

In finalizing the arrangements, Lane made it clear that the manner in which the public treats the privilege of fishing within the area will determine its future availability. He said the area was not being opened until June 1 because of the fire hazard. The ten main points of the working agreement under which the public will be permitted to fish within the area are as follows:

1. Area open June 1, 1961 to September 4, 1961, inclusive.
2. Hours will be 6:00 A.M. to 7:00 P.M. daily (EST).

3. All streams open to fishing except Meeker Run located above Blackwell Dam on Mosquito Creek which is posted for security reasons.
4. All activity to be confined to, or adjacent to streams.
5. All traffic and parking regulations as posted must be obeyed.
6. All access roads must be kept open for traffic at all times.
7. No fires will be permitted at any time.
8. No overnight camps.
9. Future policy relative to public use of these facilities will be determined largely by public behavior.
10. All persons on the Quehanna sit during this period must have a Pennsylvania fishing license.

Lane announced that access to the area will be permitted at four gates—the main gate, which is manned 24 hours a day, and the gates designated as Wykoff Run, Medix Run and Gifford Run.

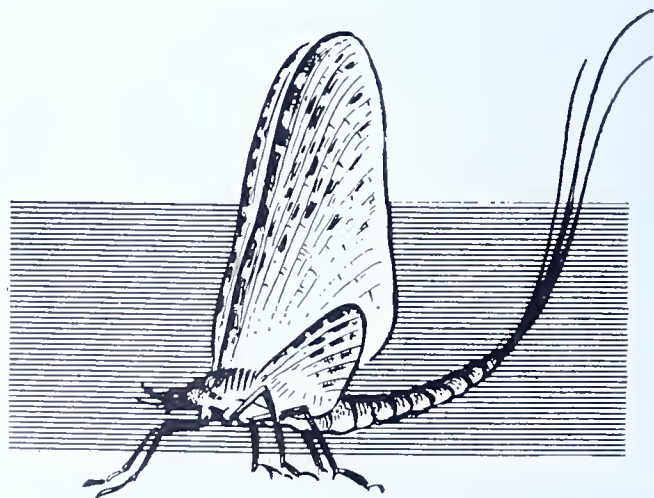
Day said that while arrangements for the opening of the area to the public had been completed too late for the planning of any pre-season stocking of trout, he expected that some of the trout scheduled for in-season stocking in the three affected counties could be diverted to the Quehanna waters. He said, however, that reports of field personnel indicate that the waters already have an excellent population of brown trout, many of which were released in the streams prior to acquisition of the area by the Curtiss Wright Corporation.

LITTLE STREAMS FOR BIG BROWNS

In the spring when the water is high, muddy and full of angle worms I use a No. 2 short-shank hook and a three inch minnow. I start the hook in the minnow's side just back of the dorsal fin and bring the point out at the gills. And fish it the same as I would a night crawler, letting it roll dead over the bottom, guiding it into all promising looking pockets.

It's a mistake to think that you can't catch trout with a minnow in real clear or muddy water. Some of my best catches have been made when the water was real clear and just right for dry fly. I've caught them when the water was muddy, too thick to drink and too thin to eat with a fork.

I am talking about brown trout fourteen to twenty-eight inches (that's the biggest brown I ever caught). You'll find few browns smaller than fourteen inches in one of these small streams.—R. N. Hamilton





Yesteryear — **PENNSYLVANIA ANGLER** — Yesterday

25 years ago

Articles appearing in the May 1936 issue included: those by C. R. Buller, Alex P. Sweigart (Editor of *Pennsylvania Angler*), Karl Kesel, R. L. Watts.

George Harvey was instructing Penn State students how to tie flies.

Red Lion sportsmen organized the Red Lion Fish and Game Association in York County. Ray Ellis was secretary.

About 700 sportsmen attended the annual smoker of the Lehigh County Fish and Game Protective Association at Dorney Park, Allentown. Charles Nehf won first prize in the 1935 fishing contest, was awarded a fly rod.

Watersnake Killing Contests were being run by sportsmen's groups throughout Pennsylvania.

The Lancaster County Fish and Game Association held a buffalo dinner at Lancaster with Commissioner "Uncle Dan" Schnabel as speaker.

Largest reported rainbow trout of the year in Pennsylvania waters was taken from headwaters of Lake Koon by Riley Swane of Cumberland, Md. It measured 24½ inches, weighed 4 lbs., 5 ounces.

Fisherman's Paradise opened for the third year.

15 years ago

The May 1946 cover was of disabled war veterans fishing for recreation program at Valley Forge, sponsored by the Fish Commission.

Articles by Don Blair, Dick Fortney (Dick Williamson), Mort White, Ralph N. Stewart, Jr., G. Earle Thompson, Charles M. Wetzel, Jim Hayes, Tom Chamberlain.

Harry J. Smith, Pittsburgh, hooked a 33½-inch, 18-lb., 4-oz. channel cat in the Allegheny River.

Albert Cole, Allentown had a 27½-inch, 9½-lb. smallmouth he caught from the Delaware River.

George Heasley displayed a 49-inch muskie from the Allegheny at Templeton.

Leo Wisniewski, Jr. of Plymouth showed a 20½-inch, 8-lb., 14-oz. largemouth he caught in Bryant's Dam, Luzerne County.

The Middle Atlantic Association of Casting Clubs held its Ninth Annual Tournament at Willow Grove Park, June 16. Mrs. Ellen A. Dietrich of Upper Darby was secretary.

Greencastle Sportsmen's Assoc. filed application for a club charter.

Sportsmen from Dillsburg formed the Dillsburg Fish and Game Association.

10 years ago

Writers for the May 1951 issue were: Albert G. Shimmel, N.R. Casillo, Bill Boyd, G. Earle Thompson, Don Shiner, Ellen Dietrich, Gene Craighead and Carsten Ahrens.

Representative George Goodling was toastmaster at the Annual Dinner of the York Federation of Sportsmen's Clubs. Speakers were C. R. Buller, Pennsylvania Fish Commission and Thomas Frye, Executive Director, Pennsylvania Game Commission.

About 800 members turned out for the 12th Anniversary meeting of the Delaware County Field and Stream Association, Inc. held at Chester. H. R. Stackhouse, Administrative Secretary, Pennsylvania Fish Commission was speaker.

Ellis Darlington was elected President of the West Chester Fish and Game Association.

The Optimist Club of Harrisburg presented their fishing awards to the Junior Fishing Kings of Pennsylvania. Kenneth Guildbord was in charge of the club youth program.

An outbreak of "mountain law" in Salt Lick Township, Fayette County, resulted in charges against local residents for throwing a stick of dynamite at a 3-man police patrol that missed the officers but tore out a section of 36-inch pipe leading from the Mountain Water Company reservoir causing water shortages throughout the Greensburg area. Injunctions against mining without permission touched off the trouble.

Personal sketches of Wardens Anthony Lech and Ross C. Bailey were presented in this issue.

(Tear Sheet) List of
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Fisherman's Paradise

Rules and Regulations—1961

(Conducted by the Pennsylvania Fish Commission on Spring Creek, 3 Miles South of Bellefonte in Centre County)



1. OPEN SEASON—May 12 to July 15, both dates inclusive. NO SUNDAY FISHING.
2. OPEN—from 8:00 A.M. to 8:00 P.M. (E.S.T.) or until Klaxon is sounded.
3. ALL ANGLERS MUST PERSONALLY REGISTER BEFORE FISHING AND PERSONALLY CHECK OUT AND RETURN IDENTIFICATION BUTTON BEFORE LEAVING PROJECT.
4. TROUT IN THE POSSESSION OF ANGLERS MUST BE DECLARED AND DESCRIBED BY SIZE AND SPECIES AT REGISTRATION BOOTH WHEN CHECKING INTO PROJECT. FISH NOT SO REGISTERED WILL BE CONSIDERED AS HAVING BEEN CAUGHT ON THE PROJECT.
5. ANGLERS MUST PARK AUTOMOBILES BEFORE CHECKING IN AND MUST CHECK OUT BEFORE REMOVING AUTOMOBILES FROM PARKING LOT.
6. DAILY LIMIT—Only ONE TROUT may be killed. The Angler must stop fishing after ONE TROUT HAS BEEN KILLED.
7. LURES—Only artificial lures with barbless hooks or regular hooks with the barbs removed may be used. No swivels permitted. Artificial lures and streamers of construction materials limited to feathers, silk, wool, fur, hair, tinsel or fiber, except that bodies of flies or streamers may be of plastic, cork or rubber. Weight or sinkers up to the equivalent of 2 BB shot may be built into the fly or streamer or affixed to the leader. Other lures commonly described as spinners, spoons, or plugs made of metal, wood, plastic or rubber, singly or in combination, are prohibited.
8. Fishing with, or possession of, any live bait, angle worms, meat, liver or any other bait, is a violation of the rules and regulations.
9. SIZE LIMIT—All fish caught from large stream under 10 inches in length and on ladies' stream under 7 inches in length must be carefully returned to the water.
10. All anglers holding a Pennsylvania Fishing License will be permitted to fish five days during the season. Angler is permitted to register once only on any one day.
11. The dressing or cleaning of fish will be permitted at the designated places, provided the fish have first been properly checked out.
12. POSITIVELY NO WADING—in the stream for any purpose permitted.
13. Fishing may be done only with fly-fishing tackle. Spinning is not permitted. Any method of fishing whereby the fly or streamer is cast directly from the reel is prohibited.
14. Feeding fish PROHIBITED except on Sunday.
15. All foul hooked fish must be carefully returned to the stream.
16. Violators of the rules and regulations will be subject to a fine of Twenty Dollars (\$20.00), and revocation of fishing privilege on the project for one year.

If you like this project you can help the sportsmen of the state by obeying these rules and reporting any infraction to the officers.

Act 673 approved December 15, 1959, as amended, provides the Pennsylvania Fish Commission with authority to promulgate such rules and regulations for the angling, catching or removal of fish in or from any waters of this Commonwealth as may be deemed necessary. Penalty for violations—Twenty Dollars (\$20.00) and in addition thereto may be fined Ten Dollars (\$10.00) for each fish caught, taken or had in possession, contrary to these rules and regulations.

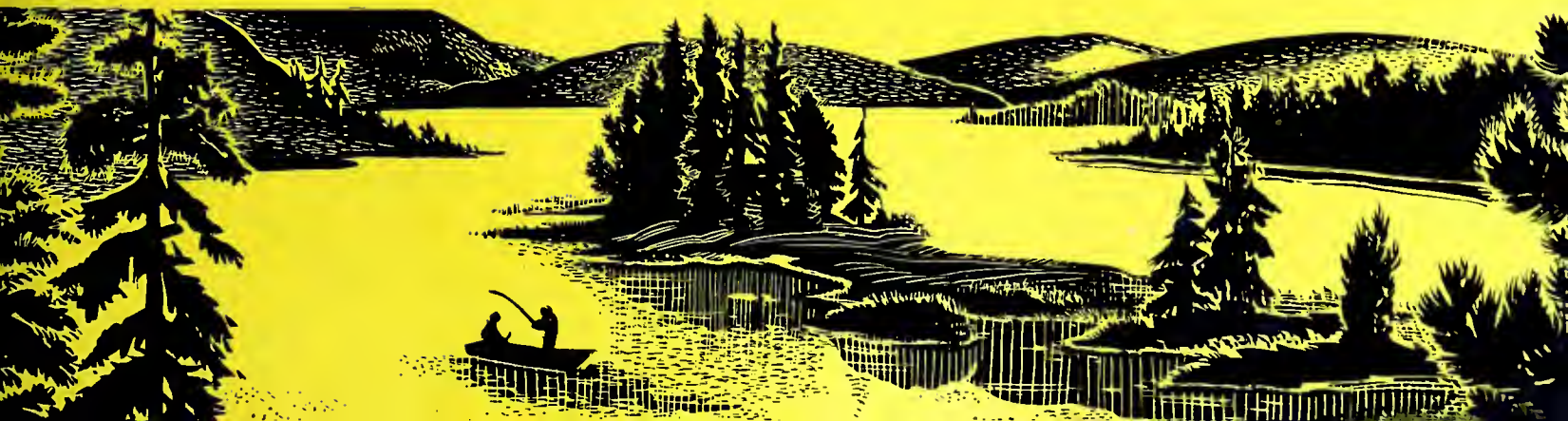
—The Pennsylvania Fish Commission
Albert M. Day
Executive Director





PENNSYLVANIA ANGLER

June 1961



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JUNE, 1961

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GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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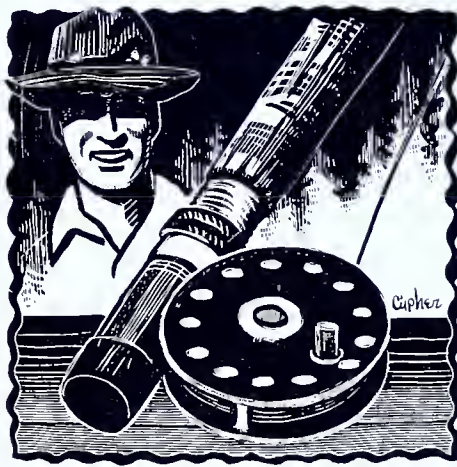
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Spotlighting Our Achievements in **POLLUTION ABATEMENT PROGRESS**

As Seen by the Sportsmen

By **ALBERT M. DAY**
Executive Director
Pennsylvania Fish Commission



Excerpts from a speech made before a panel of the Pennsylvania State Chamber of Commerce, Penn-Harris Hotel, Harrisburg, Pennsylvania, May 5, 1961

As all of you know so well this state has been the foremost pioneer in industry. In our western hills the first oil well was drilled. Thereby was created an industry which has since spread its influence to every corner of the globe. In Pennsylvania the beds of high quality coal brought on the establishment of the great iron and steel mills along our river systems. These in turn led to the creation of homes and businesses and founded our great industrial cities.

Following the usual earlier pattern of contempt for the use of public waters, the wastes and discharges from the oil fields, the steel mills, the tanneries, the breweries and all of the other industrial plants which grew up with our burgeoning civilization, went into the rivers. The Susquehanna, the Delaware, the Allegheny, the Monongahela and our other river systems became the repository for all of the wastes that we wanted to carry away from

our mills, our homes and our noses. In large part, here in Pennsylvania was fostered the tradition that the highest use of public waters was to carry away from us those things that were of use no longer.

But those times have changed. Through your Clean Streams Act, your hard headed determination to restore Pennsylvania's public waters to at least some resemblance of what they once were, much progress has been made in providing waters that are again fit for fish and for humans.

I suppose I should talk about fish and wildlife, and particularly fish, in the spot that I find myself as a representative of the State Government. I should remind you, however, that I can't talk about fish without talking about water, and I don't mean talking about *all* kinds of water either.

Fish require *good* water. In fact, they require the same



kind of water that we humans want for drinking, for swimming and for profitable industry. We can't separate fish from people, not when it comes to good living in modern America.

Too often in the long fight for clean streams and pure waters, conservationists have found themselves "on the spot," so to speak, by those who would continue to use the public streams for open sewers. Too often they have been called upon to defend themselves when asked the specious question "What do you want—fish or people?"

I say that this question can be answered very simply. We want both. Fish can't live in waters loaded with acid mine drainage, poisonous industrial chemicals or with the human wastes from our towns and cities. When fish die because of polluted waters people can't drink it, swim in it or use it profitably in industry either. So let us say that in this important aspect of our social environment, fish become a good barometer for either a healthy or an unhealthy climate for the people who live along our rivers and streams.

Water is the most important natural resource in America, or as a matter of fact, in the world. Civilizations throughout all history have risen or decayed hinged on the use of soil and water—and of these two water is the more important.

In this day of scientific miracles and atomic wonders the simple truth is that our dependence upon water is not one whit less than it was when man first trod this earth. We have developed jet aircraft to speed us in a few short hours from coast to coast; fancy chrome plated automobiles that can hardly be held under 70 miles per hour; busses and other means of transportation that have replaced the ancient beasts of burden—yet no one has ever found a mechanical substitute for water. New synthetic fabrics that are warmer in winter, cooler in summer, less shrinkable, more eye-catching than anything that nature ever devised from her own resources are displayed in store windows throughout the land—yet we have nothing that will replace water. In fact during all of these thousands of years of our civilization man has not distilled or synthesized or otherwise concocted a single drop of any laboratory substance that can do the work of water. Some try pleasant substitutes, but in the long run plain old H_2O is superior.

Today's washing machines, lawn sprinklers, shower baths, and air conditioning systems have multiplied the per capita requirement for water many times since the day when man needed only enough to quench his own thirst and to meet the needs of his animals. The demands of industry, the great machines and the technological advances that now produce the innumerable wonders of modern life are far greater than ever before. At 65,000 gallons of water to produce a ton of steel; 600,000 gallons for a ton of synthetic rubber and like proportions for the almost endless list of modern industrial products, the unslakable thirst of industry is far greater than of man himself.

Also, there are the requirements of agriculture; for we could not produce one single pound of food without water. The total agricultural demand has been growing with our population increases and our more diversified appetites.

And now, what is the situation about our national water supply? In many areas it is serious. It is so serious, in fact, that a Select Committee on Water Resources of the U. S. Senate has just completed a long study of our national water problems and recently issued a very thought provoking report, based on testimony taken during 26 hearings throughout the United States, plus studies and reports submitted by all 50 State Governors. Following the release of this report a National Water Resources Research Symposium was held in Washington, D. C., March 28, 29 and 30, 1961, to discuss this serious problem. Dr. Charles L. Wilbar, Secretary of the Department of Health, Dr. William Henning, Secretary of the Department of Agriculture, Dr. Maurice K. Goddard, Secretary of the Department of Forests & Waters and I as Director of the Pennsylvania Fish Commission were named by Governor Lawrence to represent Penn-

sylvania. Top scientists and leaders of agriculture, health and industry from all over the United States attended.

By 1975 the population of the United States is expected to be 75% again as large as it was in 1955. And, all of this in the face of no new additional sources of water unless there should be a breakthrough on saltwater conversion which looks promising for limited areas near the Pacific Ocean.

And how does this affect Pennsylvania? When we look ahead to 1980 and to the year 2000, I think we may well again become one of the greatest industrial and recreational meccas in the nation. Why? Because we have here what few other States of the Union have—a liberal supply of that scarce commodity—water. We have the hills, the forests, the rich agricultural lands that require no artificial irrigation, the lakes and streams to draw and hold the vacationists from the great metropolitan areas of the East. We have the greatest ingredient of man's needs—water. All we need to do is to clean it up so it is fit for fish to use—fish and humans.

And it can be done. As a newcomer to Pennsylvania, I want to re-emphasize the marvelous job you are now doing. Your Clean Streams Law is the best I have seen anywhere in the United States. It is a real thrill for me to serve as a member of the Sanitary Water Board and the Water & Power Resources Board and see the care with which all permits for actions which will influence the use of our public waters are scrutinized every month. A very efficient staff advises us of actions we should take to protect the public interest. Old sources of pollution are being eliminated. New sources are being prevented.

During the past twenty years, through the cooperation of industry, the boroughs, townships and municipalities of southwest Pennsylvania, the great Youghiogheny River system, which heads in West Virginia and empties into the Ohio, has gone far toward again becoming a clean stream. After local hearings attended by representatives of all groups and in general with their full support, the Board on March 23 ordered 12 municipalities in Westmoreland, Fayette and Somerset counties to cease the discharge of industrial sewage into the Youghiogheny River or its tributaries. This will cost these hard hit depression ridden communities something like \$2,140,000 for sewage treatment plants alone, but they are doing the job willingly because they feel it will help bring them better health and recreation and new industries as well. This river through continuing improvement such as this has already been changed from an acid to an alkaline stream during the past 20 years. Fishermen, boaters and swimmers now enjoy and use this great river in a fashion such as was unknown to their fathers and even their grandfathers.

One of the most striking examples of what pollution does to a river is right here in our own back door. In effect we have two rivers under our very noses—both called the Susquehanna, but biologically as unlike as if they ran down different watersheds. On the west side, the Juniata and numerous unpolluted streams which head in the

mountains to the westward pour their relatively clean waters into a basin divided by a continuous chain of mid-river islands. On the west side of the islands, the water is clean and fishing is good. It is a fine place for people to live.

East of the Susquehanna island chain, the situation is completely different. From Pittston, above Wilkes-Barre and for 140 miles south to York Haven Dam below Harrisburg, the east half of the Susquehanna River is a virtual biological desert. Practically no fish food organisms exist here—hence little fishing. That situation is being gradually improved however. Acid mine drainage is diminishing and measures are being taken to clean up pollution. The State Sanitary Water Board on March 13, 1961, ordered the city of Wilkes-Barre to cease the discharge of some 13,000,000 gallons of untreated sewage from 63,000 persons daily into the Susquehanna River. Actions such as this may some day permit its reclassification also.

We need to seize every opportunity presented through the Small Watershed and Soil Conservation Service programs, the Department of Forests & Waters and the Fish and Game Commissions to create new lakes and flood control structures. Even the highway program can be used to good advantage in creating new water control structures.

Better water reclamation pays off in economic benefits. Listen to this. Very recently a large manufacturing concern moved from New Jersey to one of our cities in north-central Pennsylvania. They invested \$4,500,000 for new buildings and machinery. They freely admitted that one of their prime reasons for choosing this location was its good water supply, its protection from floods and abundant recreational opportunities for their employees because of a recently completed flood control reservoir.

In southwestern Pennsylvania another new industry has recently settled a short distance downstream from a Forests & Waters impoundment, because clean waters now provide recreation for their workers. Clean streams mean good business.

So, I say to you representatives of industry and commerce in the great Commonwealth of Pennsylvania, please be patient with we folks who keep talking about pollution and fighting for clean waters. It is not for fish and ducks and swimmers and boaters alone that we argue. What is good for fish is good for industry.

And with the growing natural crises in water demands, Pennsylvania in 1980 or certainly by year 2000 might well regain the position it is now losing to the West. They are running out of water. We are not. We have God's most precious gift in abundance forever, one which they have not. All we have to do is take the acid and the sludge and the filth out of our waters and economic benefits are bound to follow. We can then see the national population trend again shift to our side of the balance sheet.

★ *RECORD MUSKELLUNGE*

• THE FABULOUS muskellunge has been damned, praised, and lied about. Damned because they are temperamental and scarce; praised for their gaminess and size; and lied about because they are an ideal fish to fit the prevarications of the angler.

The length to which a fish can be stretched in the telling, and still not be ridiculous, is governed in the main by the maximum size the species may obtain. However, be-

cause of the great length that 'lunge do obtain, the story tellers have pulled out all the stops. Some of these stories may not be figments of the imagination, but truths the average fisherman finds hard to believe. Other musky stories have grown with the retelling.

One often wonders if the fish were really bigger years ago, or if this business of fishermen stretching the truth is inherent and has persisted down through the centuries. For instance, in the mid-nineteenth century, the small lakes in western Pennsylvania were famous for lunker 'lunge. One was reported taken from Connaught Lake, Bradford County, which weighed almost 80 pounds. In the first place, there is no Connaught Lake in Pennsylvania, nor secondly, there were never any muskellunge in Bradford County as now constituted. However, checking through history, one finds that Bradford County once extended as far west as what is now Crawford County, and Connaught Lake was probably what is now known as Conneaut Lake, which is still famous for its muskies.

Other tales originated from this area about the same time. Thaddeus Norris claimed he had a muskellunge head preserved in alcohol, from western Pennsylvania which measured 25 inches in circumference. This was a fair size fish considering that the head of a 40-pound musky is about 18 inches in circumference.

The granddaddy of muskellunge stories was old in 1864 when Thaddeus Norris recounted it in "The American Angler's Book." To retain the atmosphere of the times, the following story is presented just as he wrote it almost 100 years ago.

"One of the stories alluded to, I heard many years ago, when detained at Wheeling, Virginia (Ed. Note—Wheeling at the time was in Virginia), waiting for the Cincinnati packet. It was from the hostler of the hotel opposite the steamboat landing. He told me that the proprietor, who was then on a fishing excursion to the Kanawha, on a former trip had taken a Pike which reached clear across the dining-table, after its head and tail were cut off; and that it was necessary to have a tin boiler made expressly to cook it. He did not say how much wood was consumed in boiling it, probably less than a cord. From his 'dare-devil' air, and the leer in his eye I had a faint impression that he was quizzing me. But he affirmed positively as to the length of the fish, as he sat in his shirt-sleeves, with his thumbs under his suspenders, and a very long native segar in his mouth."

The length and weight of the musky referred to in the preceding story can be judged only by one's conception of the length of dining-tables many years before 1864. Certainly it must have been a large table to seat a nineteenth century family.



NOT ALL large muskies were caught years ago. Here's a 35-pounder caught in the Sussewago Creek in 1959 by Alex Timco.

By KEEN BUSS

Fishery Biologist

Pennsylvania Fish Commission

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The Ohio drainage apparently had its share of large 'lunge. Dr. E. Sterling of Cleveland, Ohio, claimed to have speared one of these monsters about the year 1844 which weighed 80 pounds. It must have taken two hands to throw that one out on the bank.

They didn't catch all of the big ones in the nineteenth century, or at least the stories weren't limited to that century. The "Minocqua Times" of Wisconsin reported in 1902, a muskellunge taken from that state which weighed 102 pounds. Another Wisconsin muskellunge which is described as an unofficial record weighed 70 pounds, 4 ounces. In 1952, an authenticated world's record, at that time, was taken in the Chippewa Flowage of the Badger state which weighed 69 pounds, 12 ounces, three ounces less than the present world's record.

Michigan has never allowed Wisconsin to outdo it in musky stories. In 1919, a 100-pounder was reported captured in a net in Intermediate Lake in the Wolverine state. The world's record muskellunge from 1940-47 was taken by Percy Haver from Lake St. Clair. This fish weighed 62½ pounds. This was not the limit of Mr. Haver's accomplishments. He also caught muskies of 59, 58½ and 56½ pounds. In a single day, he took five muskellunge which weighed a total of 187 pounds! His consuming aim in life is to catch a "musky" larger than any he caught before.

Since the Great Lakes are more expansive and diverse, it would be expected that a real "whopper" would be reported from them. So that this point is not lost, it has been claimed that a commercial fisherman on Lake Huron found a muskellunge dead in his net which weighed 125 pounds. This is a tough tale to beat no matter what may be in your fish-story telling pipe.

Here's a modern unauthenticated record for Pennsylvania, which will hold your pants up, by Mr. Lewis Walker, II, an ardent musky fisherman, and who, with his father, manufactured zippers. In 1924, he reported catching a muskellunge from Conneaut Lake, Pennsylvania, which weighed 54 pounds.

The official world's hook-and-line record is a muskellunge taken from the St. Lawrence River in 1957. Other reported state records are West Virginia—43 pounds, 52½ inches; Ohio—30 pounds, 47½ inches; Wisconsin—69¾ pounds; and Tennessee—22½ pounds, 46 inches.



IS THIS the Pennsylvania record muskellunge? This fish caught in 1924 by Lewis Walker, II, from Conneaut Lake was reported to weigh 54 pounds.

The Field and Stream Magazine Fishing Contest Records for the five all-time record muskellunge are:

Weight	Length	Date	Where Caught
1. 69 lbs., 15 oz.	64½ in.	9/22/57	St. Lawrence River, N. Y.
2. 69 lbs., 11 oz.	63½ in.	10/20/49	Chippewa Flowage, Wis.
3. 67 lbs., 8 oz.	60¼ in.	7/24/49	Lake Court O'Reilles, Wis.
4. 64 lbs., 8 oz.	58 in.	5/17/47	Favil Lake, Wis.
5. 62 lbs., 8 oz.	59 in.	6/28/40	Lake St. Clair, Mich.

Now that you have read the records, both fact and fiction, perhaps you know a bigger one—muskellunge that is. The Fish Commission is interested in obtaining authenticated reports, but remember this quote from Frank Buckland (1880) which appeared in the Michigan Conservation:

"From the days of Gesner downwards, more lies—to put it in plain language—have been told about pike than any other fish in the world; the greater the improbability of the story, the more particularly is it sure to be quoted."



INDIAN MARKINGS on Big Indian Rock, Susquehanna River below Safe Harbor Dam. A spot marked fire pit by drawings of the rock showed many fires had been built there, whether ceremonial fires of Indians or by white shad fishermen is questionable.

■ Some years ago we told in this magazine about the famous Conewago Potholes in the bed of the Susquehanna River. We indicated that there is a considerable difference of opinion concerning the origins of these surprising features in that locality. It may be of interest to many people to learn that there are other unusual things about the lower valley of this great river. The potholes have no monopoly as features of geological interest in the river's bed.

Sometimes such things are discovered by accident. In the opening years of the present century, when surveys were made to locate a site at which to place a hydroelectric dam across the lower Susquehanna River, a very unexpected disclosure was made. In the vicinity of McCall's Ferry and Holtwood, soundings conducted by the McCall's Ferry Power Company, under the direction of Cary Hutchinson, the company's chief engineer, were placed at the disposal of Edward Mathews, a consulting geologist. As a result Mathews made the first scientific investigation of the river's bottom between tidewater and Washington Borough. What he found proved interesting and baffling.

In this stretch of the river, prior to the building of the dam there were many typical Susquehanna islands which stood only a few feet above water, and a few whose summits rose 100 feet above the river. The Susquehanna here flows through a deep gorge, well isolated, and therefore an ideal place to construct a dam. It was within this gorge between the islands that soundings showed six long spoon-shaped depressions, some over 100

RIDDLES



WALNUT ISLAND PETROGLYTHS. Many have been destroyed by erosion, but rudimentary forms of picture writing helps throw light on earlier stages of the development of graphic symbols.

feet in depth, with the deepest portion reaching below sea level. It was these deeps that caused Mr. Hutchinson to call in a geologist. They certainly posed several problems, but as the answers in no way affected the location of the dam, it was left to others than the power company people to solve the riddle. The problem was purely academic. Stated in simple words, here it is: how did these deeps originate?

All that interested the power company was their presence. On the other hand, geologist Ed Mathews wanted to know how they got into the bottom of the river, and it

THE LOWER SUSQUEHANNA VALLEY

DR. RICHMOND E. MYERS

Moravian College



*Photos—Courtesy
Pennsylvania Historical and Museum Commission*



ORIENTAL OR CHINESE, at first glance, and even Phoenician but more likely of Indian origin. Comparisons of symbols on treaties between tribes and Sir Wm. Johnson show some resemblance to figures found on Walnut Island.

was he who made the first attempt to explain their origin. Fortunately he was in an excellent position to study them. When in the due course of events the river bottom was laid bare by the building of a coffer dam in the early days of construction at Holtwood, the first of the deeps was exposed for examination. This deep lies close to the Lancaster County shore. Today it serves as the tail race for the power house. During construction it was dry, due to diversion of flow. The deep is almost a mile long, it is 250 feet wide, and 40 feet in depth. Throughout its length its walls showed deep vertical potholes of various sizes. To geologist Mathews this suggested "the fluting of a pipe organ." He was enthralled by the problem. As a result he gave it much attention, and in the end published a paper informing geologists that the deeps existed.

All other deeps exposed showed similar characteristics. Of course they may not be observed today, even in periods of low flow. That is where Mathews had the advantage that geologists of today are denied. He saw them. In the visitor's gallery at the power house at Safe Harbor an excellent diagram with a splendid profile shows their positions, depths, and dimensions. This is based in part on more recent surveys, but it is largely the results of observations made when the deeps were first noted.

How did they get there? Similar deeps elsewhere have been explained by various reasons, but none of these seem to apply to those in the Susquehanna River. The most generally accepted theory is that they were created when the Susquehanna River carried the meltwater of the great continental ice sheet, at the time when the Mohawk-Hudson outlet was dammed by ice. The force of this great quantity of water probably moved thousands of boulders along the river bottom, enough to do the actual work of abrasion and excavation needed to carve the deeps. However, if this were so, it seems that some of those tools would be lying around today, yet none were discovered when the deeps were dry! So like the Conewago potholes, the deeps of the Susquehanna gorge remain one of the unsolved riddles of Pennsylvania geology.

The rocks of the same section of the river offer another riddle of quite a different nature. Many who have fished these waters know of the petroglyphs often seen on the boulders in the river. Petroglyphs are picture writings carved in stone. In the strictest sense of the meaning the the inscription on a tombstone could be classed as a petro-



BIG INDIAN ROCK, upper end of Lake Aldred in lower Susquehanna. Many of the symbols found on this rock have been destroyed by vandals, others eroded to point where it was impossible to trace a complete figure.

glyph, but generally the term is restricted to the picture writings of primitive peoples, and thus we must consider those of the lower Susquehanna.

For many years it has been known that rocks in the lower gorge of the Susquehanna River have in numerous instances been inscribed with carved symbols. These symbols were thought to be some kind of writing rather than decorations. Who carved them, and what message or story they carry, are two great unsolved enigmas of American archaeology.

Scholars have been interested in these pictures for many years. The first reference to them on a scientific level was made in 1871 in the Transactions of the Anthropological Institute of New York. Since that time various people have studied the inscriptions, but not until 1930 was any serious attempt made to coordinate the whole story in search of a possible answer.

This came about with the building of the dam at Safe Harbor. Before the area above the dam went under water, the Pennsylvania State Historical Commission sent an expedition under the leadership of Dr. Donald Cadzow, to remove any picture writings that would be flooded, photograph and make casts of any that could not be removed, and at the same time make an intensive search for any evidence that might shed light on the Susquehanna's "who done it?" No such intensive investigation had heretofore been attempted. Literally, no stone was left unturned.

One of the sites above the dam was Walnut Island, now under water. It was of particular interest. On this island several groups of writings were found that were impossible to remove. These were carefully photographed and models were made. To try to establish an occupation of the terrain contemporary with the petroglyphs, trenches were dug across the island. A very temporary white occupation was indicated near the surface, but this was known without digging.

Below this there were indications of Indian habitation such as pottery fragments and arrow points. These were

all Angonkian but they were separated from the writings by about eight feet of hard packed soil. This geological evidence indicated the carvings had been made by a pre-Algonkian people. A two year search on other islands and along the shores of the river failed to reveal any culture contemporary with the Walnut Island petroglyphs.

On the other hand petroglyphs found on Big and Little Indian Rocks below the Safe Harbor Dam have been dated as the probable work of Unami or Lenape Indians. These were likely made just prior to the invasion of the Iroquois which took place immediately before the advent of the European on the Susquehanna scene. These writings differ strikingly from those of the older culture. They too have defied any attempts at translation, and therefore add another unsolved riddle to the story of the lower Susquehanna.

Should you care to see some of these mysterious carvings, the State Museum in Harrisburg is the place to visit. Also, at the small museum in the power house at Safe Harbor, there is an excellent scale model of Big Indian Rock, showing its inscriptions. Exhibited there are also many artifacts found on the islands by Dr. Cadzow and his people prior to flooding.

For those who may not be in a position to visit either Harrisburg or Safe Harbor, it might be well to describe the petroglyphs. To begin with they are crude, childlike and often unintelligible as to their true meanings. On the other hand, often their very simplicity leaves no doubt as to what is represented. Then too, by comparing the Susquehanna petroglyphs with pictures made in other media such as weavings, paintings on cloth or skin, or designs on pottery, it is sometimes possible to recognize figures not well cut or badly weathered.

Two general groups of these pictures have been recognized on Susquehanna rocks. One consists of actual representations of objects. This would include figures of such things as animals. The thunder bird and turtle are cases in point. Both are easily recognized. However, it

is difficult to say whether a quadruped is a bear, wolf, log, or fox. When it has horns it is probably a deer or elk. Buffalo may be spotted by their thick torso. The problem, however, does not lie in merely recognizing the animal, but knowing the symbolism of that particular beast.

The other group of symbols are those which represent ideas. This is like Chinese writing. Oddly enough, many of the Susquehanna characters closely resemble oriental alphabets. This resemblance has led some students to jump at hasty conclusions, attributing the Susquehanna carvings to the Phoenicians, but without anything more than a striking similarity on which to base their decisions. One old river-man, who used to live at Pequea, attributed the carvings to "moon men," and his theory has just as much validity as the Phoenician story.

Of course the Susquehanna petroglyphs have been carefully compared with similar inscriptions made by American Indians elsewhere. The far west is full of such rock carvings, and there are many others closer home. Inscription Rock on Kelly's Island in Lake Erie off Sandusky contains similar carvings, but offers no key to the writings on the rocks near Safe Harbor. Carvings on rocks along the Allegheny River in Venango County have failed to shed any light on those found in the lower Susquehanna country.

Some of the most common figures are those of human beings, men or women. Often a man with his right arm raised appears on the carvings. This could mean "peace." The figure of a bending man might mean "submission." It could also mean "supplication." Such suppositions are based on known meanings of Indian rock-writings elsewhere. The trouble about the Susquehanna rock pictures is that nobody really knows.

To assume that they are Indian writings is taking a lot for granted. Some are, that we know, but what about the rest? Do they contain the story of a race that one time lived in the lower Susquehanna country centuries before the Indians were there? It may well be so. Certainly most of the Susquehanna writings are established pre-Algonkian. From that point on the story is lost in dim antiquity.

To add to the troubles of the would-be reader of these Pennsylvania hieroglyphics, many are so badly weathered, that their original nature is quite obscure. This at least gives a feeble clue to their age. What is worse, in recent years vandals have destroyed many of the writings. Some people went so far as to chip their own markings into the rocks with the pre-historic carvings. Initials were found in a number of instances. One joker had actually cut into a rock the words, "Kilroy was here."

All of which we deeply deplore, but it does not fool the archaeologist. Thanks to the work of men like Donald Cadzow we have come closer to an understanding of the meanings of these writings than ever before.

If you are interested in seeing a good series of drawings and photographs of these petroglyphs, we refer you to the Safe Harbor Report No. 1, by Dr. Cadzow, published by the Pennsylvania Historical Commission in 1934. In it you may see exactly what these carvings look like, and as the newsboys often shout from the street corners, "Read all about it."



Profile Rock

Looming boldly above the highway and gazing intently at the Susquehanna River is an Indian face, located on highway 42 near Bloomsburg, Columbia County.

To passing observers, the striking profile chiseled from rock, appears as a monument to the red warriors that roamed the river many centuries ago. Actually two separate rocks are required to produce the profile, and as the observer passes beneath the cliff, the two rocks separate and the face disappears.

Some residents in the area say it is a natural formation. Others say it was carved by repeated blasting charges used to cut the highway through the cliff wall. Who is correct matters little. The profile exists today and so prominently that it is listed on most road maps of Pennsylvania.

—DON SHINER

WALLEYE

in Pennsylvania

PART IX

by

JACK MILLER and KEEN BUSS
Fishery Biologists
Benner Spring Fish Research Station
Pennsylvania Fish Commission



THE WALLEYE, not a pike or pickerel, but a fast growing member of the perch family.

■ The walleye is the gourmet's delight. He may lack the fighting ability of the smallmouth bass but connoisseurs of fine food claim the walleye is the best eating of the fresh-water game fish. Because of the eating qualities of this largest member of the perch family, the walleye is pursued by anglers from Great Slave Lake in Canada to northern Alabama and from Nebraska east to Labrador.

The walleye derives its name from the large opaque eyes which when spotlighted at night glow like the eyes of a cat. They occur in all types of water from shallow, stained bog lakes to large deep, clear lakes. Large reservoirs usually provide their favorite habitat. Lakes with rocky shorelines or with incoming streams provide the necessary areas for spawning.

This large "perch" spawns over rock, sand or gravel areas soon after the ice goes out. The eggs are broadcast in water two to four feet deep and left unattended. One female, depending on its size, will produce 35,000 to 600,000 eggs.

Walleye are considered rapid growers but the females grow faster and obtain a greater size than the males. The growth rate falls off as the walleye get larger, dwindling to less than an inch a year when the fish approach the thirty inch class.

The largest walleye on record is a 36¼ inch fish taken in Ontario, Canada. It weighed 22 pounds, 4 ounces. In Pennsylvania, fish over 30 inches and 10 pounds are rare. The majority of walleye caught range from 12 to 22 inches and from ½ to 4 pounds. Walleye reach one pound at about 15 inches and increase rapidly in weight thereafter. A 21 inch fish will weigh approximately 3 pounds.

The length-weight relationship for walleye from Pennsylvania waters is shown in Table I.

TABLE I
Length-Weight Relationship of Walleye
from Pennsylvania Waters

Length in Inches	No. of Fish	Average Weight in Pounds
12.0-12.9	28	0.6
13.0-13.9	22	0.7
14.0-14.9	16	0.9
15.0-15.9	10	1.1
16.0-16.9	23	1.4
17.0-17.9	21	1.6
18.0-18.9	21	1.9
19.0-19.9	19	2.4
20.0-20.9	14	2.6
21.0-21.9	17	3.1
22.0-22.9	15	3.9
23.0-23.9	6	4.6
24.0-24.9	7	5.3
25.0-25.9	3	5.5
26.0-26.9	1	6.0
27.0-27.9	3	7.3
28.0-28.9	1	9.3
29.0-29.9	3	10.0
30.0-30.9	3	9.4
31.0-31.9	1	11.5



WHEN WALLEYE ARE BITING, they provide fine sport and good eating.

Photos by Johnny Nicklas—Pennsylvania Fish Commission

The walleye is found in the large rivers, the Delaware, Juniata, Susquehanna and Allegheny in Pennsylvania. They are also present in many lakes and excellent fishing for this species is found in large lakes and reservoirs such as Pymatuning, Conneaut and Wallenpaupack. Although fishing is best in the larger rivers and lakes, some small lakes provide walleye fishing.

The growth of the walleye in Pennsylvania (shown in

Table II) is fairly constant for the first three years and becomes more variable as the fish grow older.

Walleye are not consistent biters and catches occur sporadically. When you hear this fish is biting, then is the time to rush to your favorite walleye ground. If you are in time, you will be rewarded with some fine angling and eating which would even bring a smile to the face of Epicurus.

TABLE II
Average Calculated Total Lengths of Walleye at
Each Annulus in Pennsylvania Waters

WATER	COUNTY	YEAR CLASS										
		NO.	I	II	III	IV	V	VI	VII	VIII	IX	X
Susquehanna River Dams	Lancaster	63	8.4(63)	12.9(40)	16.3(40)	19.4(9)	21.3(3)					
Susquehanna River, N. Br.	Bradford & Wyoming	5	6.9(5)	11.7(5)	17.8(3)	23.4(1)	26.4(1)					
Juniata River	Mifflin & Huntingdon	10	8.4(10)	13.6(9)	15.2(1)	17.0(1)	20.7(1)	23.1(1)	25.8(1)	27.3(1)	28.8(1)	
Allegheny River	Warren	10	9.0(10)	14.4(10)	17.0(10)	20.7(2)						
Pymatuning Lake	Crawford	117	7.9(117)	13.6(96)	17.4(36)	20.7(25)	23.3(13)	25.2(9)	26.7(7)	27.8(4)	28.8(3)	29.0(1)
Conneaut Lake & French Creek	Erie & Crawford	10	6.4(10)	11.4(10)	15.1(10)	17.6(10)	20.0(9)	22.8(5)	26.6(1)	28.0(1)	29.0(1)	
Lake Wallen-paupack	Pike & Wayne	55	6.8(55)	12.4(54)	17.6(37)	19.9(26)	21.4(14)	21.5(5)	22.2(1)			
Kyle Run Dam	Jefferson	12	6.6(12)	11.4(9)	14.9(8)	17.2(5)						
Wrighter's Lake	Wayne & Susquehanna	18	6.2(18)	10.4(18)	14.0(15)	16.9(10)	19.7(3)	22.2(1)				
Lake Carey	Wyoming	22	7.4(22)	13.1(13)	16.9(12)	20.2(6)	23.0(1)					
Miscellaneous		15	6.8(15)	14.0(14)	17.7(12)	20.2(9)	23.4(5)	24.6(3)	26.4(1)	27.8(1)	29.0(1)	
Average Size			7.3	12.6	16.4	19.4	22.1	23.2	25.4	27.8	28.9	29.0

() Number of fish at each age class.

tying the Muddler Minnow

★

The popularity of Don Gape's Muddler Minnow has spread throughout the country the past few years and nowhere has it found a more receptive audience than the smallmouth bass of Pennsylvania's rivers and streams. The versatility of the Muddler makes it a highly desirable inhabitant of the fly rod bass fisherman's kit, and the angler who likes to "roll his own" will find it an easy fly to tie.

Use the step by step procedure used in tying the Muddler, as illustrated in the photographs.

If you are tying the Muddler in the larger sizes it is desirable to use size #00 or #A tying silk or nylon since the pressure required to spin the hair at the head of the fly is considerable. Various color combinations of head, underwing and body are worthy of experimentation in different locales.

The Muddler is a three-way winner and it pays to vary your method of fishing until you find the combination that the smallmouth prefer. Fished upstream as a dry fly, it is a good 'hopper imitation; fished across and downstream in the surface film, an emerging nymph imitation; with water squeezed into the head to make it sink, a conventional streamer fly. On good water, the smallmouth will take the Muddler consistently, and this is probably the most important requisite of any good fly.

★



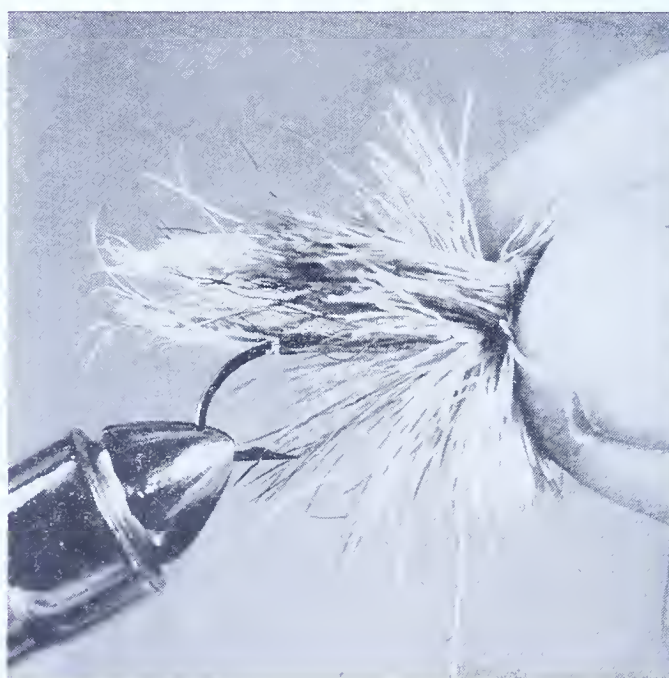
Select a long shank, relatively fine wire hook, from size #6 to #12 according to preference. (Shown is a size #8 salmon dry fly hook.) Tails of paired sections of turkey wing quill are tied in and thread is spiralled forward two-thirds the length of the hook shank. Flat gold tinsel is tied in and wound back to base of tail, then wound forward continuously over the first layer.



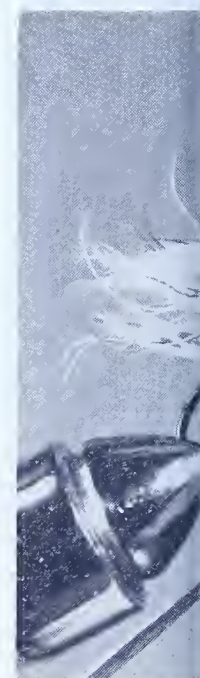
Half hitch thread away excess tinsel out overlapping from lumps. Yellow tinsel if desired.



For hackle, cut a medium size tuft of deer, caribou, or antelope body hair, grasp hair by butts in right hand and slide hair over eye of hook to proper position so that your thumb and index finger are gripping not only the hair but the shank of the hook inside the hair. (Caribou hair is shown). Take two loose turns of thread completely around hair slightly forward of wing butts and, without relaxing grip on hair, pull down firmly on thread with left hand. Still maintaining a firm tension on thread, press back butts of hair so that they flare around hook, then move thread forward of hair and half hitch.



Cut another tuft of body hair, hold it over hook just forward of hackle hair, take two turns of thread around hair and hook, slowly pull down on thread and at the same time release your finger grip on hair, allowing hair to spin around hook.



Move third eye of hook.



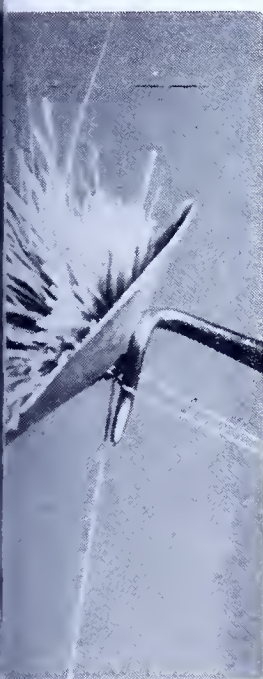
the end of body and trim
your tinsel closely with-
th, two layer body, free
n may be substituted for



A sparse underwing of mixed black and white hair
of calf tail is tied in. Trim away excess hair and
apply lacquer to butts.



For wings, select two sections of paired turkey
wing quills, place back to back over underwing, and
tie in over butts of hair.



and whip finish at



Trim head to bullet shape but allow the hair
hackle to remain as a sparse fringe around the base
of the wing.



A drop of lacquer on the whip finish completes the fly.

recipes for

WALLEYE



By **DON SHINER**

Photos by the Writer



HERE WE ARE TROLLING, just drifting along tryin' to snag a walleye.

HERE WE SNAGGED ONE . . . many times this glassy-eyed critter'll just come along quietly until he sees somebody . . . then, old friend, hold everything!



■ Looking for some real *red hot* walleye fishing? Then drift troll a plastic worm and spinner combination some summer evening. The glassy-eyed walleye will sock the lure like a sub depth charge and splash plenty of water in your boat in the process!

This we discovered one day last year on one of Penn's inland lakes. We were old acquaintances of the walleye but the plastic worms were new to both of us. We originally purchased packages of these synthetic worms to try on bass, totally unaware walleyes, too, find them real tonsil ticklers.

The episode this afternoon unfolded as we arrived and pushed the boat free of the trailer. I glassed the lake for signs of activity. The little round windows in the binoculars revealed concentrations of boats drifting in a confused pattern near the point of one island. The numerous boats held my attention. Gatherings of fishermen could spell only one thing: schools of walleye were found and were biting!

We packed the gear between the boat seats, and with a pull of the rope, the motor awakened with a lively, purring rhythm. Soon we were nearing the drifting convoy.

A steady breeze whipped the lake into moderate waves. Boatmen turned it into an advantage by drifting with the wind. Motors were silent. Only when staging a re-run across this portion of the lake did the anglers kick the outboards into action.

As we glided toward the edge of the boat concentration, our suspicions were confirmed. These were walleye men. One angler had just then netted a husky specimen.

Rigging our rods, we trailered gang hooks behind spinners, added sinkers and three-way swivels. Then, a search of the boat, . . . we had forgotten the dew worms. In our haste to be afloat, the container was left stranded at the

HERE HE IS . . . still pounding around thrashin' up a storm.



boat doek. A serious omission but not fatal. Packages of plastic worms had been in my tackle box for several weeks. Now was the time for these new synthetic baits to come to the aid of our party. We broke open a package, fitted the soft worms to our hooks and dropped the outfits overboard. Leaning the spin stieks against the boat side, we relaxed and remained silent, like pieces of driftwood afloat.

The wind blew the boat across the choppy cove at a lively pace. The rocking motion was soothing. The gentle rolling, coupled to the warm sun lulled me into such a drowsiness I almost flipped at the sudden sledge hammer blow pounded on the rod.

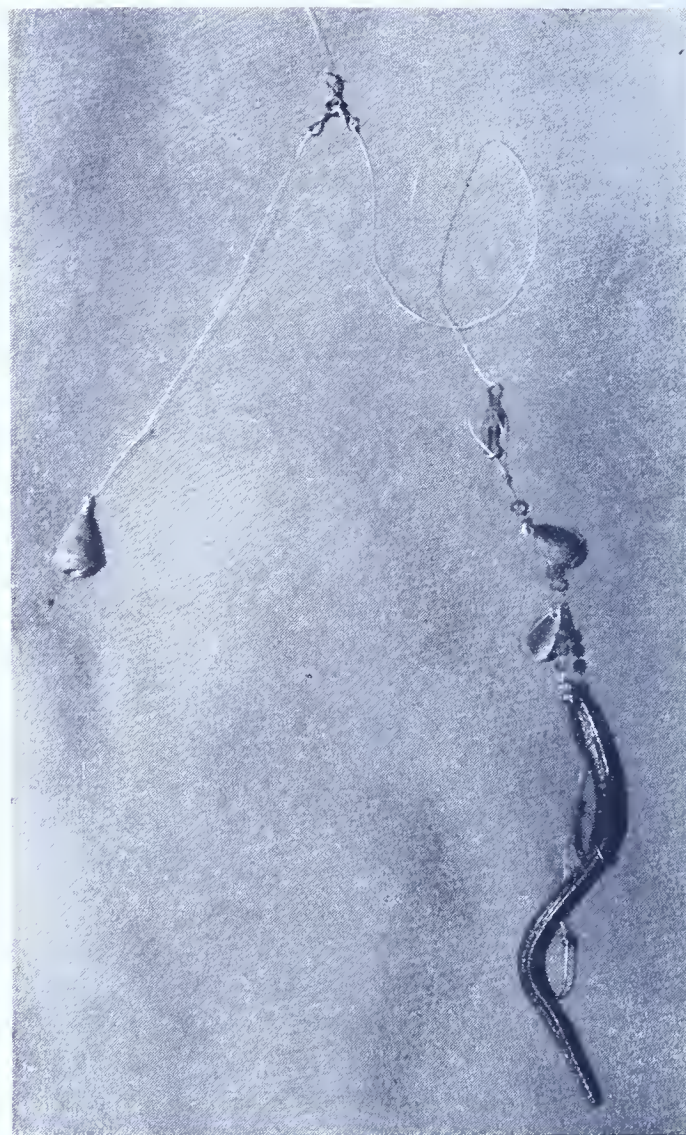
Wide awake now, I grabbed the rod and felt a strong, throbbing weight. Reeling line, the fish soon rolled on the surface. As the net hoisted the fish aboard, I held the first of several husky opaque-eyed walleye in my hands that afternoon.



AND HERE HE IS AGAIN . . . in the bag . . . just keep your fingers out his mouth and watch those gill covers . . . if you detest a bloody stump!



RIGS THAT TAKE 'EM . . . double spinner, gang hook, plastic work, sinker and 3-way swivel.



TROLLING LURE LINE-UP . . . shows popular rigs for walleye.

We found the walleye recipe under the sleepy summer sun. You drift-troll 40-feet of line to keep a plastic worm and spinner bouncing across a lake bottom as the wind propels the boat. It's lazy fishing, true, but few fishermen fall asleep when a walleye decides to wake you up.

There's a real treat in store for those who dine on walleye fillets the first time. Connoisseurs consider the flesh of this fish among the finest of all fresh water species. Taste for yourself using this recipe for pan fried walleye:

PAN FRIED WALLEYE

1. Clean and fillet the freshly caught walleye. If frozen, thaw just before using.
2. Cut fillets or walleye steaks in serving pieces. Dip fish in undiluted evaporated milk.
3. Roll in mixture of equal parts of flour and corn meal, well seasoned with salt and pepper.
4. Heat enough butter in a sauté pan to cover bottom and cook fillets for 3 to 5 minutes on each side, turning carefully with a fork or flat turner to prevent breaking the thick, golden brown covering. Add more butter to the pan when needed. Do not overcook.

5. Serve the fish very hot on heated plates with lemon or parsley butter, chilli or tomato sauce or ketchup.
6. Now ring the dinner bell and have the family enjoy the finest meal that fresh water can offer fishermen. Truly, the walleye is among the finest tasting fish found in Pennsylvania waters.

Or try BAKED WALLEYE IN TOMATO SAUCE

- 1½ pounds fresh or thawed walleye fillets
- 2 teaspoons salt
- 1 small onion, minced
- 3 tablespoons minced parsley
- 3 tablespoons butter
- 1 6-oz can tomato paste
- ⅛ teaspoon thyme
- ¼ teaspoon pepper
- ½ bay leaf
- ⅛ cup grated Italian cheese

Wipe the fish with a damp cloth and cut into serving size pieces. Arrange the pieces in a buttered, shallow baking dish and sprinkle with ½ teaspoon salt. Cook onion, parsley in hot butter until onion browns. Add remaining ingredients and heat thoroughly. Pour sauce over fish. Bake in moderate oven, 350° F. for about 30-minutes. This is sufficient for four average servings. Ingredients other than the walleye cost about 20-cents.

Tips On Finding Fish

Fish act a lot more like people than people might suppose. When the water is too warm or too cold, they go where it is more comfortable, just as we seek agreeable air temperatures. Fish enjoy shelter, just as we do. They rest in the shady protection of weed or lily beds; behind submerged rocks, stumps or logs, or in the cool, dark currents below undercut banks. If the current is very fast, they lie in calmer water behind boulders or other obstructions, like people taking protection from strong winds. Fish rarely venture very far from these hiding places, except when migrating or in search of food. They like to find hiding places as near to their feeding spots as possible.

Brooks and streams wash food into ponds and lakes. So you'll usually find good fishing around hiding places at the stream mouths. Weed or lily beds in coves and off points of land are excellent spots for bass, pickerel and other pond-fish. An abundance of food such as insects, frogs and bait-fish live in such places. These spots provide protection for big fish, as well.

Submerged weed beds are excellent fishing locations for the same reason. Frequently you'll see rocky or sandy patches among the weeds. These should be productive for trying your bait or lure.

Let's remember, too, that fish need oxygen, just as we do. Pools under waterfalls are abundant in oxygen, and usually in fish food. Stream mouths are good for the same reasons. But stagnant water (especially when it contains rotting vegetation) has very little oxygen, so you'll find few, if any, fish there.

One of the most important factors (and one too often disregarded) is that of water temperature. Fish in general congregate in water which is neither too hot nor too cold, just as we humans prefer our homes at a temperature of about 70°F. While some species of fish prefer colder water than others, the favorite temperature range for most of them is between 50°F. and 70°F. If surface waters are warmer, most gamefish will be found down deep, where it is cooler. When surface temperatures are comfortably cool, the big fish should be near the top. That's one reason, for example, why bass feed in the shallows in the evening, rather than during the heat of the day.

When we consider these simple facts in relation to our favorite lake or stream, we realize that most of the area of the water may not be very suitable for finding fish. We also realize that certain places fulfill the requirements of gamefish for agreeable temperatures, concealment, food and oxygen. These places should be the "hot spots." Undoubtedly we'll have better luck fishing in these "hot spots," and forgetting about the rest. We don't need a thermometer to tell us if the surface water is too warm. If it feels warm, probably we should do our fishing down deep. If it's cool or moderately cold, surface lures should do the trick.

—Joseph D. Bates, Jr.

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Many people get on the conservation train but a great many of them are traveling in the sleeper.



Going for Broke on BASS

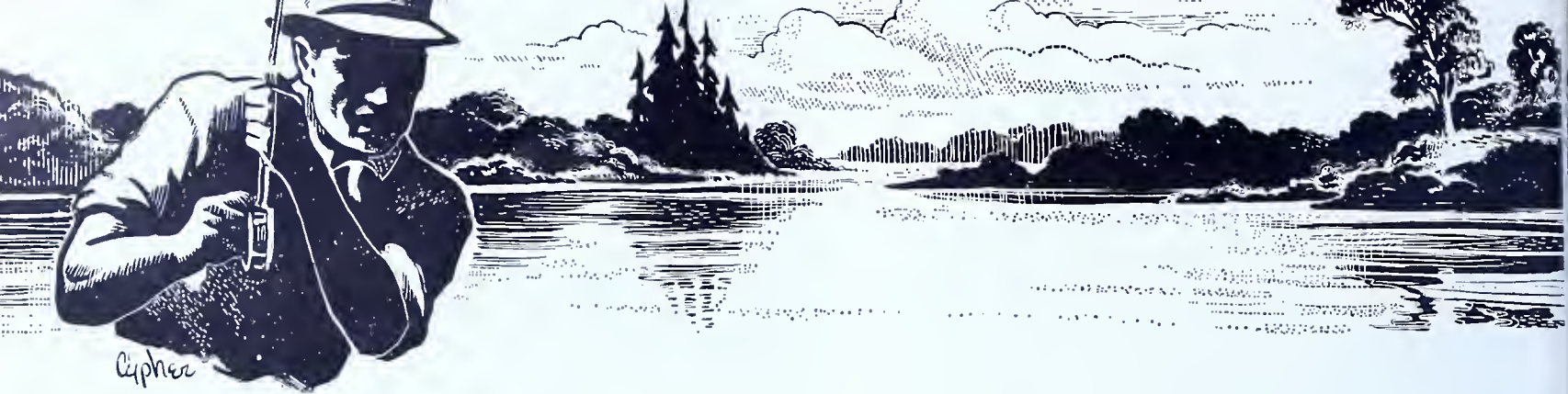
■ Good sized bass are often hard to catch. And they are especially hard to catch on those streams which are predominately populated by hordes of smaller ones. Yet big, or at least decent size bass can be caught on any of the Pennsylvania streams I have fished, and I've covered quite a few of them, if one goes about it properly. For I am firmly convinced that to get better than average bass you have to first determine that you are going after them, then time your arrival on the stream and your fishing tactics to conform with the habits of these larger fish.

For these "lunkers" do have a set of habits all their own. In the first place, they are definitely nocturnal in their feeding periods, and from my own experiences, would say the bigger they are the less likely they are to chase after fast moving baits. They are more apt to lay at the heads of pools when they are feeding. And they are more easily spooked by flashing lights than their smaller brothers when fishing for them at night.

To be specific, let's consider Kettle Creek; one of the more famous of the full-of-small-bass streams. For a couple of years my fishing partners and I took a whale of a shellacking on this beautiful creek. But we stuck with it, for it was one of our favorite trout streams in the early part of the season and we had established ourselves as "fishing boarders" with a most congenial family on its banks. And I suppose we would have continued to take a shellacking for a few more seasons before we wised up or quit the place entirely. Except, for an aged neighbor who passed the place every evening on his way down to the creek to fish.

At first, we pitied the poor old fellow, for we thought he was so busy during the day and early evening that he had to do his fishing in the dark. But one summer night we happened to be out on the porch when he came up from the creek with three really nice bass; and these fish out of a stretch of stream we hadn't taken a single bass over eight inches in two full days of fishing. This started some thinking! And the thinking brought us to the point where we decided to have a try at night time fishing.

To be truthful, this was the turning point in my fishing career. It took all of us some time to pick up the knack of fishing in the dark, but the results were so much better than we'd been having the trials, troubles and tribulations were overlooked. Each successive fishing trip found us spending more and more time on the creek in the dark



of night. Since then, I have been a confirmed dark-of-the-night'er in both my bass and trout fishing.

Logie alone would tell you this is the proper time to fish for big fish, but somehow, fishermen aren't logical about it. Day after day they go on crowding each other on limited fishing waters then leave the stream almost isolated at the time fly hatches are in full swing. Small land based animals and insects are moving about, possibly to fall in the water, the minnows and chubs have moved out into the shallows in search of nymphs that have crawled from beneath the stones, easy prey for larger fish. The darkness of night furnishes a natural protective cover from the fish's natural enemies.

Of course, the most obvious reason they do this is that fishing at night does present a lot of problems. One of these is the difficulty in changing lures or baiting a hook in the dark. I think it can best be done by leaving the stream and going well back in the streamside bushes where a flashlight can be used. You've got to be doubly sure its light doesn't flash on the stream or you'll have a half hour of dull fishing.

Another is the problem of getting hung up. This can be avoided by fishing a stream large enough and shallow enough you can take a stand well out from the bank, but still not be in danger of casting on the opposite shore.

On such a stream, too, it may be possible to find a pool or deep run where it takes a full night's fishing thus eliminating the problem of moving around. This can be murder! Don't worry about fishing the place out. A good spot on a large stream can be fished night after night, and good catches made, without danger of seriously depleting its fish population.

There are other problems too, not the least of which are the punkies and mosquitos. You'll take these in stride once you've felt the solid tug of a good fish somewhere out there in the dark. And, after a host of breathless moments, and a number of good fish lost, you'll learn to net the biggest of them without a light. Somehow, the bend of your rod, the soft sound made by a tired fish weakly struggling on the surface, and an instinct that tells you where to place the mouth of your net, all combine in a routine procedure that lets you bring those big babies to reel.

But, night fishing isn't a snap in any sense of the word! It's a rough, tough, go-for-broke proposition that can take the sap out of the best of us, and there'll be nights when you wish you'd stood in bed. Yet, in the end, it's sometimes the only way to take big bass consistently. So, if its big bass you want, go out there in the black night with the rest of the owls.—Don Neal

Versatile Pork Chunk

Drift logs lay half submerged in the cove. Weed beds covered most of the open water except for a few narrow channels extending out from the springs and sand bars. It was evening and the calm surface of the water was broken occasionally by the rings of rising fish. The frogs grumbled and complained as the thunderheads piled high in the west. My partner joined the frogs in their grumbling. Our surface plugs must be cast to the very edge of the weed mats in order to tempt the bass to rise. Frequently a cast went slightly astray and accumulated a load of greenery that ruled out the possibility of a strike, and disturbed the surface of the water enough to send any self-respecting bass into hiding. The solitary specimen that was the result of hours of sustained effort was barely above the size that our pride would allow us to keep.

As if in answer to our problem a boat appeared around a nearby point. It drifted on quiet oars to the very edge of the weed mat. The old angler was equipped with a long cane pole, a line of equal length and a lure that we learned later was a home cut pork chunk. He stood up in the boat, swung the line and landed the lure with a splat close to shore. He raised his rod bringing the lure sliding back along the surface. Sometimes he paused and allowed the lure to rest for a moment before bringing it closer to the boat. Before half the cast had been recovered, the weeds exploded and the chunk disappeared. The rod dipped slightly then swung up in a tight arc. The bass left the weeds and was deposited without ceremony in the bottom of the boat.

He pulled into the cove where we sat, fastened his boat to a stump then lifted a stringer of four bass of a size that usually come to expert anglers, singly, once or twice during a season. He greeted us politely as he stepped ashore, but did not tarry. We had a brief glance at his lure, a chunk cut to imitate the shape of a frog.

By the end of summer we had acquired passable skill at carving chunks from salt pork purchased from the local butcher. It was a laborious and somewhat messy task and our casting rods lacked the length to hold the line above the weeds on long casts. Occasionally we fouled in the vegetation but we were catching larger fish with a regularity that was satisfying.

Pork chunk can be purchased in several forms, sizes and colors at most sporting goods stores. Most popular are the frog-shaped chunks with backs dyed green or yellow with round spots, the tadpole-shaped chunk with its streamers of red yarn extending out from either side and more recently the black eel strip and the brown strip cut to

imitate a night crawler. All of them handle rather easily on spinning tackle. A weedless hook makes it possible to fish them in situations that would be rather difficult with ordinary hooks. The addition of a small nickel or copper spinner makes them more attractive. The black eel and the night crawler strips are best used with a gang hook. The addition of a small plastic keel does away with the nuisance of the lure twisting the line if it happens to be mounted a trifle off center.

By working a hole through the chunk and securing the hook with a bit of copper wire allows the hook to be mounted behind the chunk itself and permits the hooking of a fish immediately on strike. If the lure is hooked through the tip a greater percentage of fish are hooked if the fish is permitted a second or two to get the chunk well within its mouth before the strike is made. We have experimented with bass and find that they will carry the lure several feet before spitting it out. Pickerel and northern pike will sometimes follow the lure and pick it up from the bottom when it is motionless. This observation has been made a number of times in clear water and proves to our satisfaction at least that the fish take it for something edible.

The strips are very effective in deep rocky waters where bass are feeding on hellgrammites and small eels. With enough weight to take it down these strips can be teased along the bottom rather slowly and will tempt fish that are too lazy or too sluggish to take a faster moving lure. I am convinced that much of our fishing is done in a manner that causes a lure to move much too fast.

There are a number of models of hooks on the market but none of them will catch fish as certainly as the weedless variety. The nature of the environment where the above lures are used rules out the possibility of using hooks with unprotected points.

In testing several models of weedless hooks on the market we have come to prefer the type made to loop under the point of the hook just ahead of the barb. This weed guard when made of properly tempered wire will depress under the strike of a fish enough to allow the hook to take a hold yet may be fished through heavy weeds and over the tangled logs of beaver brush with a minimum of lost tackle. We carry a small hone and use it religiously in keeping the hooks needle-sharp. We find that the percentage of hooked fish rise in proportion to the sharpness of the hook.

One old-timer gave his opinion as to the effectiveness of the pork chunk, "Them big fish know the difference between a chunk of meat and a hunk of wood, and I reckon they'll take the meat every time! If you want some good sport try a chunk in the jungles of pads and marsh grass. It may spoil you for open water fishing."

—ALBERT G. SHIMMEL

★

If you fish for carp, you must put on a very large measure of patience, especially to fish for a river-carp. I have known a very good fisher to angle diligently four or six hours in a day, for three or four days together, and not have a bite.

—Izaak Walton

Bass Bugging

Aside from live bait, poppers and plugs seem to be the most popular lures for bass, although flies account for many lunkers. Why some fishermen prefer these larger lures over flies is a matter of conjecture or opinion. Maybe poppers and plugs are easier to present to gullible fish.

But are poppers or plugs more effective in taking bass? Some old-timers say there is nothing better than a standard-type surface plug used at twilight or at dawn when the big ones come up to feed.

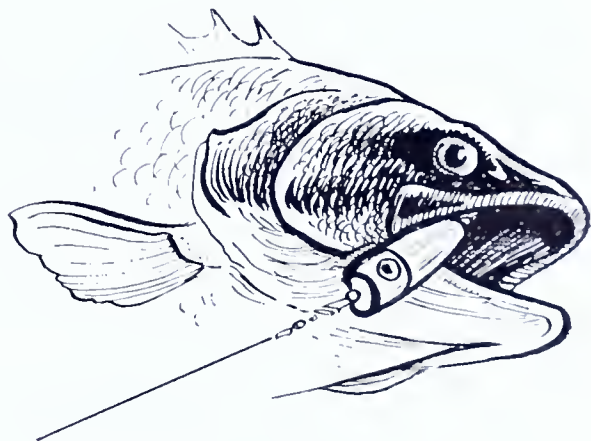
Others wouldn't even go near a plug, but stock their tackle box exclusively with poppers of all types. The more the merrier. These fishermen figure somewhat like plug fishermen. If one popper doesn't work, another might. The change in plugs sometimes works because they have *different actions*. It doesn't matter whether your popper resembles a mouse, frog, or sports a feather and a bunch of hairs. They all go burp, burp, burp. They have *much the same actions* and cause the old bronze-backs to smash at your lures.

Since you usually pop from a boat, you can move around to those hard-to-fish areas. Sure you can plug from a boat. But don't waste your time fishing a barren spot! Watch for a popper fisherman the next time you go lake fishing. Since his lure has only one type of action, and he doesn't get a strike at first, he knows that the fish aren't biting in that area so he moves on. You can follow the same procedure with your plugs.

There are all types of plugs, such as crawlers, skitterers, wigglers, etc. These are surface plugs. If you are going to fish in the afternoon, when it is hot and the bass are down, you should use underwater plugs such as spinners, spoons and wobblers. A strip of pork rind attached to your spinners and spoons is an added attraction. If you are fishing for Northern pike, nothing is better than a silver spoon with a piece of pork rind.

There are many different ways to use poppers and plugs. However, before we talk about the use of poppers and plugs, let's take a look at the differences between popper and plug tackle.

If you are a plug fisherman, you have the choice of the conventional casting tackle or spinning tackle with



light lures. If you prefer poppers, you usually use a light fly rod, although you can pop with spinning tackle. Since most bass fishermen like to angle because of the sport itself, you will have a lot more fun if you use poppers on light tackle. Let me illustrate.

Suppose you go plug fishing with the ordinary casting outfit. You make your cast near an old log with some brush and weeds around it. The chances are that you will have to "horse" the bass to keep him out of the brush and weeds. Now suppose you are popper fishing at the same spot and you get a whopper on. Because the popper is lighter, has only one hook instead of a set of gang hooks, and your tackle is much lighter, that bass, instead of heading for cover, is going to jump all over the place trying to throw the hook. He has his chance to get away and you have more fun trying to take him on light tackle.

Some fishermen will still keep on using their plugs despite the fact that plugs don't seem to resemble anything in nature. These fishermen seem to think that plugs make the fish mad. It is very probable they don't, but bass are attracted by anything that looks like food.

Bass don't have to have good eyesight to gobble up something that apparently has fallen in the water and is struggling to get away before an untimely end catches up with it. Bass know exactly the actions of mice and frogs. Poppers work because they imitate some unfortunate mouse or other creature and *not* because of the sound a popper makes. Fish can sense vibrations—either in the water or along the shore. So to make your poppers more effective, try to make them imitate small creatures that have fallen in the water.

The techniques of working poppers are many and varied. Each fisherman has his own pet ideas, but develops and changes them for the locale he is fishing. But the fundamentals of surface fishing, whether you are using surface plugs or poppers are much the same.

On different streams and lakes of Pennsylvania, I have seen poppers laid on the water quietly and cautiously, like trout fishermen fish dry flies. At other times, I have seen fishermen, working with fly-rods slap the water hard with their poppers when conditions called for it.

And some fishermen slap the water behind them, when popping from a boat, before finally placing their bugs where they think they will do the most good. What would these fishermen do if a hefty bass struck while the popper was on the water behind them?

A plug fisherman I know counts to thirty, after his cast, before he moves the lure in any manner. He says he does this because his big plug has just as much chance of spooking the fish as it does of attracting them and he is liable to come home with an empty stringer so he counts to thirty to assure the fish that all is well on the surface.

I have seen spin-casters, who prefer poppers to plugs, actually start to reel in before their lures hit the water. This produces a "streak" on the surface which is often tantalizing to bass.

Each of these three types of fishing is different only in personal preferences. After these anglers have tried out their own ideas, they go back to the same burp—rest—burp technique.

Old-timers will tell you that to work a popper right,

you must first know the disposition of the species of fish you are trying to catch. And they are right! Fishing conditions always vary between species and locales and the successful fisherman is the one who has enough "horse sense" to adapt himself to the area he is fishing.

When the bass are feeding, it's no trick to get them to strike. But when the sun gets high they prefer seclusion and only a good reason will make them stir. Bass like to rest in weed-beds and old tumble-down logs and piers, not to mention lily-pads.

If it is hot, any lure will usually pass as a minor disturbance. But if you can get it to the right spot, too much is too much and you may find yourself fighting a lunker.

Early season and late season fishing with poppers is much different from the sport during the hot summer months. In summer, bass are inclined to be stubborn, but during the early and late season they are much more active.

Whether you prefer to use poppers or plugs, the most important part of fishing is good sportsmanship. Have tolerance for the man who uses live bait and plugs, though I think the man with the poppers has the most fun and catches the most fish. And when the chips are down and I go after a big bass, I wouldn't trade my poppers for any plugs. I've learned poppers will take the cagiest of whoppers.

—GORDON L. STROBECK

★

Small Stream Bass for Teenanglers

The fish weren't anything compared to those caught in Dale Hollow or any of the other big bass waters of the country but they were nice fish for the waters we were fishing. Both measured exactly the same 15½". The stream we were fishing is only about 30 miles from the Philadelphia city limits. It is no wider than 12 or 15 ft. at its widest but it gives us two or three bass each year over 14" and quite a few 12". Some of the holes are as deep as 6', and that's why bass can live here.

If you see a shallow stream from the road take a walk along it. Many fishermen pass up such streams and one who "walks a little" sometimes finds good bass fishing.

I have fished both large and small waters for bass and like small water best. The fish aren't always as mighty as on larger waters but there are usually less fisherman.

In most cases I have found the food problem of little concern. Minnows, crayfish, hellgramites, and other foods are found in abundance.

The number of successful fisherman can have a noticeable affect on bass. In some places fished by few, if any, other fisherman, bass of 6 or 7" will hit on nearly every cast. Of these it may be wise to take all the state will allow of legal size in order to cut down the population and allow some of the bass to reach larger sizes.

In many waters fished heavily by bass fisherman who return all except bass to the water, the sucker population is now out of all proportions to the bass.

We have such a stream near here. My fishing buddy



Small Blacks

Veteran anglers often nominate a small black as the "best-fly." The small blacks certainly are productive lures. We use 16 Black Stone as an all season last-resort lure—after all the "killers" have had their chance. Some days the Black Stone in size 14 is very productive. A size 18 is also an all-season favorite, and in cold water of opening day the 18 may be the only lure that will take trout.

Because of pollution and/or erosion very few streams have sufficient fly food for trout. Trout can not live well without adequate supply of fly vitamins, and they should relish any occasional water or land flies. There is some evidence black or brownish-black stoneflies hatch in streams from February to late May. Specimens we have preserved were taken 3/29/51, 2/20/54, and 5/26/59. On two occasions we have seen the black stoneflies emerging and trout taking them near surface of water. Black caddis, gnats, midges, alder, mosquitoes; as well as the stoneflies have been seen along streams several times every season. Small black land flies have been seen along streams from first sunny spring day until snow falls. Therefore, prevalence and availability of black flies indicate they can be taken daily by trout.

Undoubtedly the small black or brownish-black flies predominate in water and on land. Practically every day of the season trout can find these flies in the stream because of habitat or by accident when land flies get in the water. Hatches of the stream varieties are usually sporadic, and we need not be on the stream at any particular time as with the Mayflies.

There are several materials that can be used for body of the small blacks; condor quill, dubbing mixture black and brown fur or wool, crow wing fibers, ostrich herl, chenille. Wing materials are dun or black hackle tips, starling or coot wing sections. Our favorite pattern is unstripped condor quill body, very small blue dun hackle tip wings and black hackle legs. Size 18 is tied with only small dun or badger hackle wrapped on hook instead of the regular dressing.

A fine leader tippet is essential when fishing the small blacks. Par is 6X, however 5X or 4X may produce in fast water. A very common hazard in angling is fear of losing a large trout with light tippet or small hook. There is actually no sound basis for this fear. The average flyrod increases the strength of the tippet about five times, which means 6X will easily handle a 7 lb. trout; and undoubtedly the tippet would break before the small hook straightened out. One thing is quite certain, if fine tippet is not used, wary trout will not strike and the tippet will never be put to a test. Don Martin captured 15½ lb. brown with 3X gut (1.6 lb. test), which is less the strength of new 6X nylon (1.8 lb. test).

Mr. Trout likes the small blacks served on a long-fine leader.

—Art Clark

•

*Yet, if you enter the woods
Of a summer evening late,
When the night air cools on the trout-ringed pools
Where the otter whistles his mate . . .*

—Kipling

and I take only two bass a day from it. Our size limit is 12". In most cases we don't even take these unless the family is hollering for bass to eat and we can't take any from other waters in the area but this rarely happens. I think it's also a good idea to make special trips to fish for suckers and other rough fish to help get the fish population in better balance.

As far as size goes you can't expect a stream 15 feet wide to give you a limit to take home every day of the season. In balanced small streams it is best to take only a few when needed and return the rest. If you're not a meat fisherman you can have lots of fine sport this way.

The tackle to use for these bass is either light fly or light spinning tackle. My own outfit consists of light fly rod, level line, and 2-lb. test level leader.

You can't pick any one bait as best. At times they'll hit anything. At other times they'll be plenty choosy. If there is such a thing as an all-around bait it is worms. I like artificials myself and take as many with them as any other way. I do like to put a minnow on at dusk when the bass are hitting on top. I hook the minnow just under the dorsal fin and he swims around the top making a slight disturbance which drives big bass crazy.

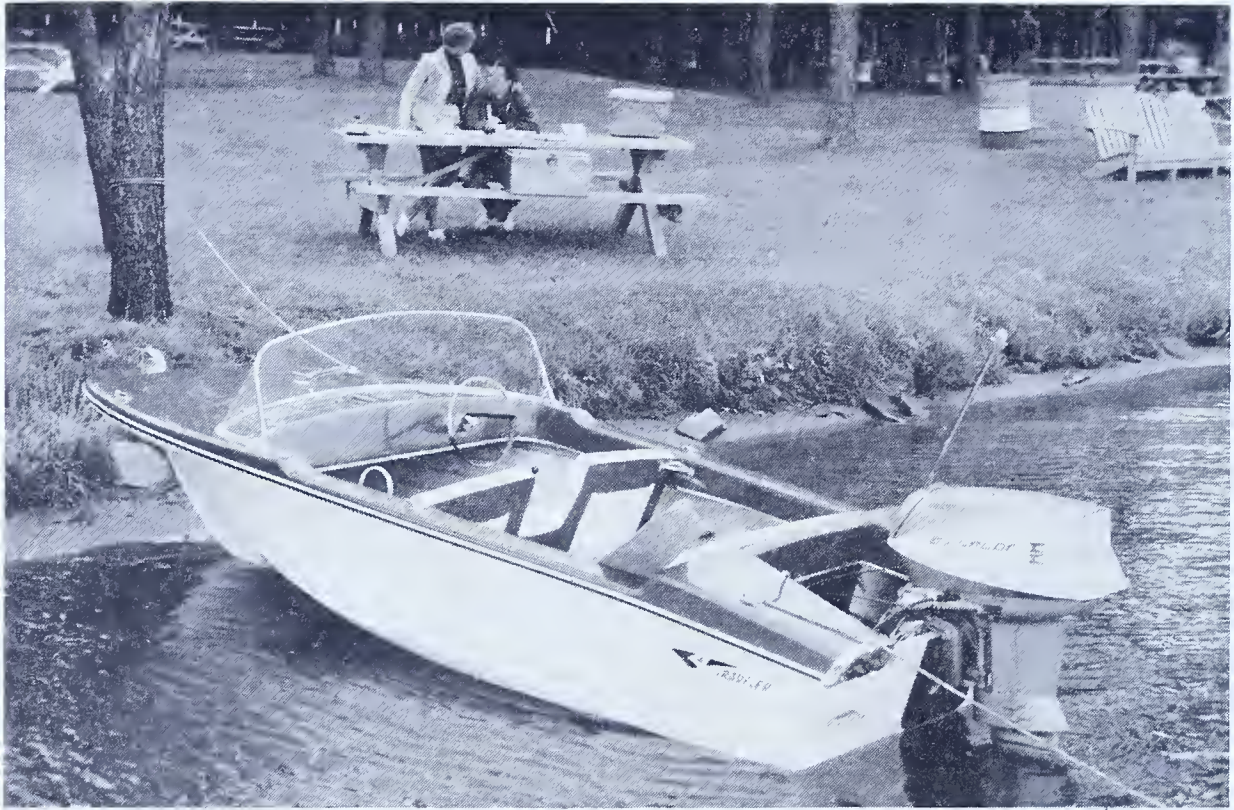
Flies are good at times. I have had pretty good luck with them and a streamer will take bass.

The best times to fish are at sunrise and dusk. You can usually have action during any part of the day even if it is only with small bass. The 15½" I told you about was taken at around 3 o'clock in the afternoon so you can't really say when they'll hit for sure but as a rule the times I mentioned are when the big ones hit best.

Give these small streams a try. I am sure there are some in your area even if you live near a large city. I live in Norristown which is about a 20 minute drive from Philadelphia and there is a very good one not an hours ride from where I now sit. Look them over. Watch for bass swimming in the water. You'll see them; most likely there'll be a few fair sized ones. They won't be as big as those in Dale Hollow or some of the other great bass waters of the country and you won't catch a worlds record but with light tackle you'll get as much fight from a 12" bass as you would a 5 pounder on heavy tackle.

These streams are hard to beat for the man who has a couple of hours before or after work to fish and doesn't have time to go very far. You'll probably find you're the only one fishing on the stream or at the most you'll find one or two others like yourself who have discovered Small Stream Bass.—Tony Stavenski

Boating



Evinrude Motors Photo

PERFECT DAY for boating and picnicking with your best gal on an early summer day. Everything's just perfect when your craft has been properly tied and anchored fore and aft as top photo shows.

BUT LOOK . . . in bottom photo our friend had hurriedly ran the prow into beach and bank, left 'er untied! And, there he is leaving a pretty girl sit while he chases a runaway boat!

It happened April 15, 1961 _____



Scranton Times Photo

APRIL 15? . . . it sure is and dern hard to believe! District Game Protector Frederick Weigelt, R.D. 1 Honesdale holds 16 and 18-inch rainbow trout hooked via tip-up through 20 inches of ice on a northern Wayne county lake. There was, in addition, a 10-inch mantle of snow atop the ice!



Warden Wm. McIlroy Photo

MORE BRRRR . . . but these fellows are sloshing around up to their ears in sleet and ice fishin' for suckers, in Shawnee Lake, Bradford County. Caught fish too!



Scranton Times Photo

BRRRRRRRR! That's exactly how it was opening day along the Lehigh River, Lackawanna County. Despite snow and wind and freezing lines nothing could keep anglers from answering the 5 a.m. April 15 opening gun!



TYPICAL APRIL 15 . . . it's opening day story on Fishing Creek near Benton, Columbia County as Chief Cameraman of the Fish Commission, Johnny Nicklas saw it!



PENNSYLVANIA FISH COMMISSION CONSERVATION-EDUCATION PUBLICATIONS

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YESTERYEAR — IN THE — YESTERDAY

Pennsylvania Angler

25 years ago

Writing in the June 1936 issue of the *Pennsylvania Angler* were: Myron E. Shoemaker, Charles Wetzel, Alex P. Sweigart, C. R. Buller, R. W. McCafferty.

* * *

George Zimmerman, secretary of Lehigh County Fish and Game Protective Association reported a big brown trout caught by Herbert F. Everett of Allentown. The fish was 22½ inches long and weighed 3 pounds, 8 ounces.

* * *

Clearfield County Federation of Sportsmen's Clubs were planning a Field Day.

* * *

Tionesta Chapter of Bucktails had commission personnel at their meeting put stress on the Fish Commission's new slogan . . . "if you would catch more fish . . . kill less!"

* * *

The WPA applications for stream improvement were pouring into Harrisburg.

* * *

Sam Smith of Rextown, Lehigh County told how he baited his hook with a sticky caramel he had been chewing, tossed it into a nearby creek. Almost instantly he snagged a 12-inch catfish followed by half dozen more cats with sweet tooth.

* * *

The *Pennsylvania Angler* was staging a bass fly fishing contest in the state. One of the judges was Governor George H. Earle.

15 years ago

June 1946 issue carried stories by Bill Boyd, Johnny Mock, Tom Norris, Jim Hayes and Bill Wolf.

* * *

Out Somerset way photos of trout stocking included Noah Shultz, Pres. Somerset County League; John Kraig, Pres. Fayette County League and Joseph Critchfield, member, Board of Fish Commissioners.

* * *

"Brown Beauty," Pennsylvania's monster brood trout (female) died at Pleasant Gap. It measured 35 inches in length, weighed 27 pounds with a girth of 24½ inches. The trout was 15 years old.

* * *

Mrs. J. Roy Smith, Potters Mills killed a 32-inch water snake that had a 12-inch brown trout partly swallowed.

* * *

Shirley J. Orndorff of McKees Rocks, (then age 11) held up a nice rainbow taken from Dunbar Creek, Fayette County.

* * *

Joe McCronick, Eilwood City, had snagged a 28-inch, 7-lb., 1-ounce brown trout in the Slippery Rock Creek.

* * *

Probably tops in Pennsylvania Big Fish Records, was a 29½-inch, 11-lb. 4-ounce brown trout caught in the Little Lehigh by Edward L. Voyden of Allentown.

* * *

The cover showed (pipe-in-mouth) Wm. R. (Bud) Tamblyn, Call-Chronicle photographer, Allentown, netting a trout.

10 years ago

Dick Williamson, Gordon L. Trembley, Thomas O'Hara, Arthur Bradford, Albert G. Shimmel, John H. Fisher, Robert L. Rineard, N. R. Casillo, Thad Bukowski all contributed articles to the June 1951 issue.

Wallace C. Dean Reappointed to Pennsylvania Fish Commission



MR. WALLACE C. DEAN

Governor David L. Lawrence, on April 11, 1961, reappointed Wallace C. Dean of Meadville, Crawford County, a member of the Pennsylvania Fish Commission. Mr. Dean has been confirmed by the Pennsylvania Senate and will serve until the second Tuesday of January 1969. He was first appointed to the Commission by Governor John S. Fine on May 25, 1953. A life-long fisherman, Mr. Dean has been constantly active in statewide angling affairs and organizations. He is currently serving as President of the Fish Commission.

Mr. Methuselah, worn out and aged, just "upped and died." A brown trout from Well Creek Reservoir, Carbon County was 26 inches long but weighed only 2½ pounds. A post-mortem performed by Arthur Bradford, Pathologist, Pennsylvania Fish Commission gave this verdict: "Death due to old age." Mr. Bradford found the liver and other organs flabby and degenerated . . . just wore himself plumb out!

* * *

The Department of Forests and Waters turned over to the Fish Commission, the portion of the Schuylkill Canal in the vicinity of Five Locks, located south of Hamburg Pa. as a fishing area.

* * *

The Fish Commission again contributed \$250 toward the support of the Conservation Education Laboratory for Teachers to be held at the Pennsylvania State College during the summer of 1951.

* * *

Peggy Martinkovic of Summit Hill, Pa. landed a 24½-inch, 6¼-pound brown trout on the ladies stream at Fishermen's Paradise.

* * *

Opening Day on the Paradise registered 1,766 anglers catching 3,311 trout.





Pennsylvania Angler



July 1961



"TAKE A BOY FISHING" has more behind it than merely a pleasant day on lake or stream with an eager, youthful companion. It entails responsibilities.

This fine slogan brings home to us adults the realization that we must not only furnish good fishing to the boy of today, but to the man of tomorrow.

Perhaps we are one of the lucky few. We know a cool stream where the spotted trout may rise to a fly today; a lake where the bluegills are still plentiful; where the plunk of a bass plug among the weed patches will bring smashing response, or the retrieve of a wobbling spoon will entice a pike to strike with hungry power. But how about tomorrow? How about the day when the boy becomes a man? Will the fishing still be good then?

We hold the answers to these questions in our own behavior. It is our job to do something about them. We can't wait for the boy to solve his own troubles, because the accelerated pressure on sport-fishing today has brought us problems and responsibilities that cannot be put off. The issue is with us now.

America has no new frontiers insofar as sport-fishing is concerned. We have already exploited all of the available areas within the United States and are rapidly closing in on the few wild spots still left on the continent. It is up to conservation interests to see that our known waters produce at the highest possible rate. It is up to the present administrators to see that the boy you take fishing today may look forward to doing the same for another bright-eyed youngster in the years ahead.

Clean, productive waters—waters studied to determine maximum possibilities of the kinds and quantities of fish they will support, then stocked to those levels—waters held inviolate against drainage operations and pollution—waters maintained for their great recreational values.

"Take a boy fishing?" Of course. And may it be GOOD fishing!

—Albert M. Day, Executive Director



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Pennsylvania Angler

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David L. Lawrence, Governor



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JULY, 1961

VOL. 30, NO. 7

GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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NOTICE: Subscriptions received and processed after the 10th of each month will begin with the second month following.

Vacation Issue

for

Summer Outdoor Family Fun

visit

Pennsylvania

State Parks



for

swimming—boating—hiking—fishing—camping—picnicking

GONE are the summer days when a Pennsylvania family had to drive hundreds of miles to find a recreational spot suitable for the active outdoor tastes of everybody. Now it is possible to travel but a short distance in almost any direction to find one of Pennsylvania's 70 state parks, plus one recently completed and dedicated and several more under construction with a dozen new sites selected for development in the near future.

Last year 23,000,000 people enjoyed the myriad facilities of the state parks. Many were able to combine recreation with education by taking in nearby historical sites as Valley Forge, Independence Mall, Washington Crossing, Brandywine Battlefield, Fort Necessity, Braddock's Grave, Pittsburgh's Point State Park, and Presque Isle at Erie.

Unparalleled natural scenery can be found at Leonard Harrison State Park on the rim of Pennsylvania's Grand Canyon; at Shikellamy State Park looking down upon the junction of the North and West Branches of the Susquehanna River; at Ricketts Glen, where 28 lovely cascades tumble down North Mountain in Luzerne County through a virgin forest or at Cook Forest State Park, where you will find giant white pines and hemlocks as they were in the days of William Penn.

Variety in our parks embraces the sedate peace of the 60-mile long Delaware Canal, the silent wilderness on Bruce Lake in the Poconos, the popular beaches of Shawnee, or the vast expanse of Pymatuning Reservoir. Those interested in geology will find the Slippery Rock Gorge at McConnells Mills State Park or the strange boulder field at Hickory Run fascinating.

Today Pennsylvania's State Park program is designed to accomplish three goals:

1. To ring our major cities with regional parks.
2. To add attractions to our labor surplus areas.
3. To spark growth in our under-developed counties.

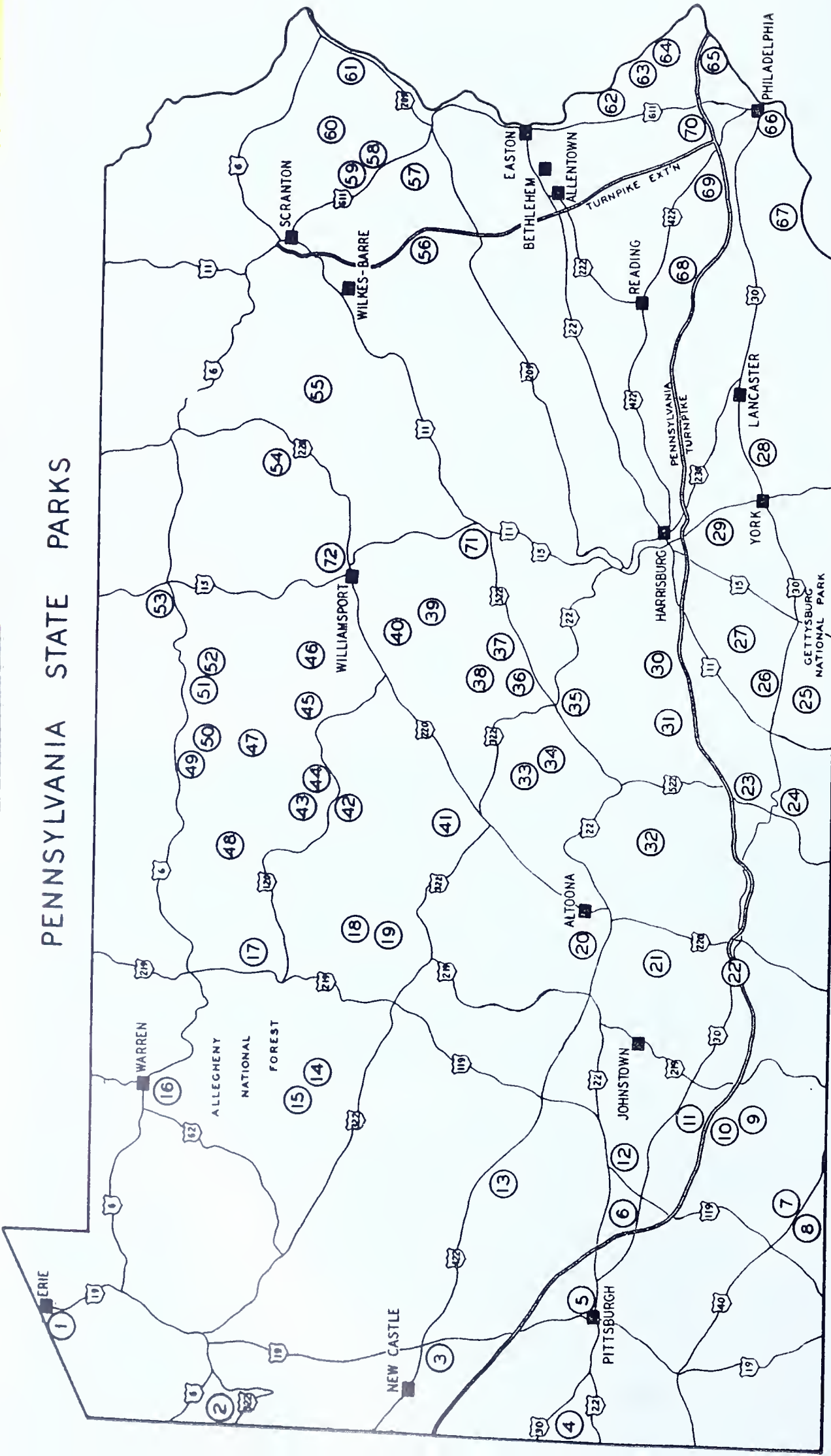
This program has been summarized in the slogan, "our aim is to build a new state park within 25 miles of every Pennsylvanian." Under this program 15 new state parks have been built within the last six years. Another is under construction northwest of Altoona, and another is nearing completion in Greene County.

Giant recreational areas have been announced on Muddy Creek in Butler County and on the Tohickon Creek in Bucks County.

By providing these facilities, Pennsylvania will continue to compete as the land of good living.



PENNSYLVANIA STATE PARKS



1. PA. STATE PARK
2. PYMATUNING
3. McCONNELL'S MILL
4. RACCOON CREEK
5. POINT PARK
6. BUSHY RUN BATTLE
7. BRADDOCK'S GRAVE
8. FORT NECESSITY
9. LAUREL HILL
10. KOOSER
11. LINN RUN
12. KEYSTONE

15. COOK FOREST
16. CHAPMAN DAM
17. BENDIGO
18. PARKER DAM
19. S. B. ELLIOTT
20. PRINCE GALLITZIN
21. BLUE KNOB
22. SHAWNEE
23. COWAN'S GAP
24. BUCHANAN BIRTH PLACE
25. MOUNT ALTO
26. CALENDONIA

29. GIFFORD PINCHOT
30. COL. DENNING
31. BIG SPRING
32. TROUGH CREEK
33. WHIPPLE DAM
34. GREENWOOD FURNACE
35. ROTHROCK
36. REEDS GAP
37. SNYDER - MIDDLESWARTH
38. POE VALLEY
39. R. B. WINTER
40. RAVENSBURG

43. KETTLE CREEK
44. HYNTER RUN
45. LITTLE PINE
46. SINNEMAHOING
47. SIZERVILLE
48. DENTON HILL
49. LYMAN RUN
50. OLE BULL
51. COLTON POINT
52. LEONARD HARRISON
53. HILL'S CREEK
54. WORLD'S END

57. BIG POCONO
58. TOBYHANNA
59. GOULDSBORO
60. PROMISED LAND
61. GEORGE CHILDS
62. RALPH STOVER
63. ROOSEVELT
64. WASHINGTON CROSSING
65. LOGAN
66. INDEPENDENCE HALL
67. BRANDYWINE BATTLE
68. FRENCH CREEK
69. FORT WASHINGTON
70. VALLEY FORGE

Pennsylvania State Parks

BENDIGO—Swimming and fishing are facilities available at this park located 3 miles Northeast of Johnsonburg off U. S. Route 219.

BIG POCONO—A picnic area 2,131 feet above sea level affording magnificent views of the Pocono Mountains. Located 6 miles West of Tannersville off U. S. Route 611.

BIG SPRING—A well forested, quiet picnic area 5 miles Southeast of Blain on State Route 274.

BLACK MOSHANNON—Bathing, boating, camping, picnicking, fishing facilities in 2,150-acre park easily reached 5 miles East of Philipsburg on State Route 504.

BLUE KNOB—This 5,597-acre State park affords magnificent view of the Allegheny Mountains. Picnicking, fishing and camping. Twenty miles North of Bedford East of Beaverdale off State Route 869.

BRANDYWINE BATTLEFIELD—Historical site and park along Brandywine Creek where General Washington was defeated in his attempt to defend Philadelphia during the winter of 1777. Eight miles South of West Chester on U. S. 1.

BUCHANAN'S BIRTHPLACE—This small park commemorates the birthplace of Pennsylvania's only president. Fishing and picnicking. Five miles Northwest of Mercersburg off Pa. Route 16.

BUCKTAIL—Historical site dedicated to the Bucktail Trail which carried pioneers westward and served as a route for Civil War Volunteers. West of Renova along U. S. Route 120.

BUSHY RUN BATTLEFIELD—Here a small Colonial force under Col. Bouquet broke the force of Pontiac's Indian uprising of 1763. Three miles North of Jennerstown on Pa. Route 180.

CALEDONIA—A large swimming pool, camping, picnicking and fishing facilities make this area an extremely popular summer "playground." West of Gettysburg on U. S. Route 30.

CHAPMAN DAM—West of Clarendon off U. S. Route 6, in the heart of the Allegheny National Forest, State park provides fishing and picnicking sites, swimming, tent and trailer camping.

CLEAR CREEK—A crystal clear trout stream provides good fishing and swimming in addition to family vacation cabins, camping and picnicking facilities. Twelve miles North of Brookville off Route 949.

COLONEL DENNING—Near Carlisle, 8 miles North of Newville above Rt. 233 is this new site for camping, swimming, fishing.

COLTON POINT—Southwest of Wellsboro off U. S. Route 6 this picnicking and camping area affords exceptional views of "Pennsylvania's Grand Canyon." Situated 1,000 feet above Pine Creek Gorge.

COOK FOREST—This park, beautifully located along the winding Clarion River, contains one of the largest remaining stands of virgin forest in Pennsylvania. Northeast of Clarion off State Route 36. Swimming, hiking, fishing, camping, family vacation cabins.

COWAN'S GAP—A 42-acre lake affords opportunity for boating, fishing and swimming in addition to camping, picnicking and family vacation cabin facilities. Eight miles Northeast of McConnellsburg off State Route 75, North of U. S. 30.



CROOKED CREEK—A flood control dam on Crooked Creek provides a 350-acre impounded lake for swimming, picnicking, boating and camping. Southeast of Ford City off State Routes 359 and 66.

DENTON HILL—Located midway between Coudersport and Galeton on U. S. 6. This is the first State park for winter sports. Ski Lodge and 30 acres of ski slopes for novices and experts. Two Poma type ski lifts.

FORT NECESSITY—A rebuilt Colonial stockade fort is the center of a historical park where Washington was besieged during the French and Indian wars. Camping and picnicking areas. Nine miles Southeast of Uniontown on U. S. Route 40.



—York Gazette and Daily Photo

GIFFORD PINCHOT STATE PARK, newest of the state parks, dedicated by Governor David L. Lawrence on May 26, 1961, is off Pennsylvania Route 74 at Rossville in the Harrisburg-Carlisle-York triangle. The park encompasses approximately 2,250 acres with a lake of 340 acres. Features include two swimming beaches, picnicking, boating (launching and mooring), food, refreshment, ample parking and sanitary facilities. Proposed: family tenting (tent and trailer), organized group camping and day camping. The lake, managed and stocked by the Pennsylvania Fish Commission, will open for public fishing in 1962.

FORT WASHINGTON—An extension of Philadelphia's Fairmount Park, this historic site has picnic facilities. Off U. S. Route 309, 4 miles North of Philadelphia.

FRENCH CREEK—Some 5,933 acres of well-wooded, rolling terrain provide many recreational opportunities—swimming (2 lakes), boating, fishing, camping, picnicking and hiking. Fourteen miles Southeast of Reading, just off Morgantown interchange of Pennsylvania Turnpike.

GEORGE W. CHILDS—A beautiful forest tract donated to the Commonwealth for park purposes. Waterfalls, fishing and picnicking. Located 4 miles Northeast of Dingman's Ferry off State Route 209.

GOULDSBORO—Approximately 20 miles Southeast of Scranton on U. S. 611 offers the visitor boating, fishing and swimming.

GREENWOOD FURNACE—All the usual outdoor recreation facilities can be found here, 20 miles West of Lewistown on Route 305.

HICKORY RUN—A forested tract of 12,731 acres abounding in clear fishing streams and a swim-

ming area; opportunity also for camping, picnicking and hiking. A geological phenomenon of great interest is a boulder-strewn field, devoid of vegetation 13 acres in size. Northeast of Hazleton off State Route 940.

HILLS CREEK—137-acre impounded lake, swimming, fishing, boating, tent and trailer camping. Twelve miles Northeast from Wellsboro North of U. S. 6.

HYNER RUN—A swimming pool, picnicking and fishing 8 miles East of Renovo. Adjoins Hyner View Vista.

INDEPENDENCE MALL—This State and National Historic site where liberty was proclaimed in 1776 contains the Liberty Bell and other Revolutionary Relics. In the heart of Philadelphia's historic section.

KETTLE CREEK—A small, secluded, forested area for swimming, picnicking and fishing. Nine miles West of Renovo off U. S. Route 120. Dam under construction will be used for enlarged park.

KEYSTONE—Located 7 miles North of Latrobe off State Route 981, this popular park contains

swimming, picnicking, camping and fishing facilities.

KOOSER—An excellent park for swimming, picnicking, camping, fishing and family vacation cabins approximately 10 miles Northeast of Somerset off State Route 31.

LAUREL HILL—Rolling mountains and hardwood forests sprinkled with streams are in this high elevation park. Excellent trails, good fishing, picnicking, swimming and boating available as well as camping for organized non-profit groups. Eight miles West of Somerset South of Pa. Route 31.

LEONARD HARRISON—Overlooks Pine Creek Gorge from the east rim of "Pennsylvania's Grand Canyon" and is one of the State's most densely wooded areas. Picnicking facilities provided. Located 10 miles Southwest of Wellsville off State Route 660.

LINN RUN—A forested tract of 1,500 acres, with picnicking, fishing and family vacation facilities. Eight miles South of Ligonier off State Route 381.

LITTLE PINE—On Pa. Route 44, 4 miles North of Waterville, facilities for swimming, boating, fishing and camping.

McCONNELLS MILL—Located near the intersection of U. S. 422 and U. S. 19, between Butler and New Castle. This park preserves a magnificent gorge created by the last glacier during the Ice Age. A natural area with hiking and picnicking.

MONT ALTO—Small forested area offers excellent picnic sites and fine mountain stream trout fishing. Ten miles Southeast of Chambersburg on Route 233.

LYMAN RUN—9 miles Southwest of Galeton in Potter County, this new State park provides all outdoor summer recreation facilities.

OLE BULL—Camping, swimming, fishing and picnicking facilities on Kettle Creek, 17 miles South of Galeton along State Route 144.

PARKER DAM—A well-organized State park which provides swimming, picnicking, camping, boating and family vacation cabins 15 miles North of Clearfield, off State Route 153.

PRESQUE ISLE STATE PARK—The only State park in Pennsylvania that has an ocean-like environment; 7 miles of sand beach and picnic facilities at Presque Isle just Northwest of Erie on State Route 832. Bird Sanctuary, unusual forest, historic monument and marina under development.

PINE GROVE FURNACE—This State park surrounds 2 lakes, Laurel and Fuller, and provides excellent swimming, picnicking and camping facilities. Fourteen miles Southwest of Carlisle on State Route 233.

POE VALLEY—Located 5 miles South of Millheim off State Route 45, in a remote mountainous area. This State park has special appeal for those who enjoy outdoor seclusion. Provision for picnicking, camping, fishing and boating.

POINT PARK—In the famed Golden Triangle where the Monongahela and Allegheny Rivers form the great Ohio, Fort Pitt blockhouse marks the site of Pittsburgh's origin. Bastions being restored.

PROMISED LAND—A variety of recreational opportunities centered about a 420-acre lake; located in the Pocono Mountains, South of Hawley along State Route 390. Ten miles North of Canadensis. New lake to be developed for campers.

PYMATUNING—Originally this 17,000-acre lake was established to supply a steady source of water to industry. Boating and fishing are most popular along with swimming and camping. North of Jamestown off U. S. Route 322.

RACCOON CREEK—An oasis of greenery in an area of strip mine operations. Wooded hills, clear streams and lakes afford excellent camping, swimming, fishing, hiking and picnicking opportunities. Twenty-five miles West of Pittsburgh on Route 18 near Frankfort Springs.

RALPH STOVER—Situated on the bank of picturesque Tohicon Creek, this Bucks County area has picnicking and family vacation cabins. Nine miles Northwest from Lambertville on Route 32.

RAVENSBURG—South of Jersey Shore off State Route 880, fishing and picnicking facilities may be enjoyed in this forested area.

R. B. WINTER—An excellent swimming and fishing lake, picnicking and camping facilities, formerly named Halfway State Park located 20 miles West of Lewisburg on State Route 95.

REEDS GAP—Camping, fishing and picnicking facilities, 15 miles North of Lewistown near Reedsville and U. S. 322.

RICKETTS GLEN—An outstanding area of natural beauty; 28 waterfalls varying from 6 feet to 100 feet high, veteran hemlock and hardwoods. Swimming, picnicking, fishing, camping and hiking. Located 3 miles North of Red Rock along State Route 487.

ROOSEVELT—Bordering the entire 60-mile length of the historic Delaware Canal from Easton to Bristol, this area has many beautiful picnic sites, boating and hiking.

SAMUEL S. LEWIS—Located 10 miles Northeast of York, off U. S. 30, this picnic area affords spectacular views of York and Lancaster Counties including the Susquehanna River.

S. B. ELLIOTT—Family vacation cabins and picnic (19) area in a beautifully wooded tract 8 miles North of Clearfield off State Route 153.

SHAWNEE—A flood control impounded lake of 451 (22) acres, nestled in rolling hills, has excellent swimming, camping, picnicking, fishing and boating facilities. Nine miles West of Bedford between Pennsylvania Turnpike and U. S. Route 30.

SHIKELLAMY—Located on U. S. 15 between Shamokin Dam and Winfield opposite Sunbury on the Susquehanna River. This park affords a magnificent vista overlooking the junction of the North and West branches of the Susquehanna River. Picnicking.

SINNEMAHOING—On the Geo. B. Stevenson (46) Reservoir, picnicking, boating, fishing, approximately 30 miles Northwest of Renovo on Pa. Route 872.

SIZERVILLE—A small swimming pool, camping and (47) picnicking area offer pleasant conditions for recreation in this forested State park 8 miles Northeast of Emporium, along State Route 155.

SNYDER-MIDDLESWARTH—15 miles West of (37) Middleburg and 5 miles West of Route 235 at Trovelville. Picnicking and fishing are excellent in this forest area.

TOBYHANNA—Located North of Tobyhanna, 26 (58) miles Northwest of Stroudsburg along State Route 490, this State park contains facilities for swimming, picnicking, fishing and camping.

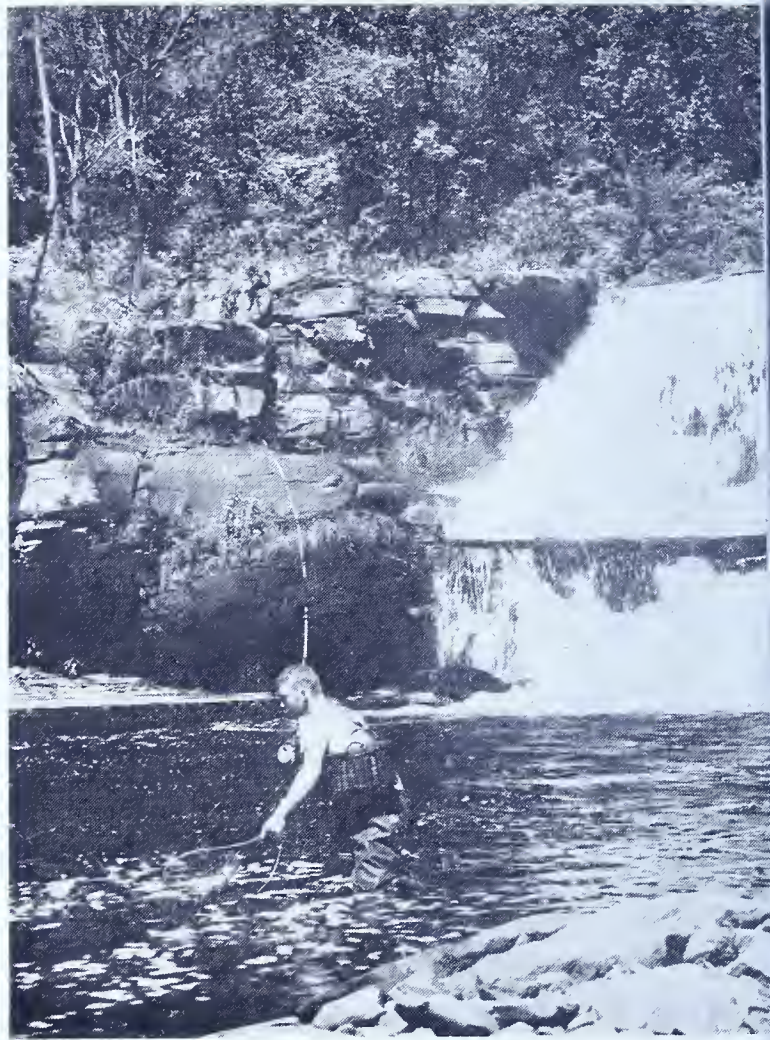
TROUGH CREEK—Camping, fishing and picnicking (32) in this secluded area. Northeast of Saxton and 20 miles Southwest of Huntingdon off Star Route 994.

VALLEY FORGE—A 1,500-acre memorial to the (70) ragged Continentals who encamped here the winter of 1777-78. Reconstructed soldiers' huts and Washington's headquarters are set in a rolling countryside that is famous for its dogwood trees in full bloom in early May. Northeast of Philadelphia on Pa. Routes 23-83 at Pennsylvania Turnpike Interchange.

WASHINGTON CROSSING—From the shores of (64) this park along the Delaware River, General Washington embarked on his Christmas night surprise attack against the Hessians at Trenton. A wild-flower preserve adjoins the park. Popular for picnicking. South of New Hope on Pa. Route 32.

WHIPPLE DAM—Excellent swimming, fishing, picnicking in this State park deep in Tussey Mountain range 8 miles South of State College off State Route 545.

WORLDS END—A unique site nestled in mountains (54) along Loyalsock Creek 9 miles North of



—Johnny Nicklas Photo

Eagles Mere adjacent to State Route 154. Family vacation cabins, picnicking, swimming, fishing, camping and hiking provide recreational variety.

Parks Under Construction

PRINCE GALLITZIN—Cambria County, 15 (20) miles Northwest of Altoona and West of Pa. Route 53.

SUSQUEHANNA—Near Williamsport on (72) Route 220. Boating, fishing, swimming and picnicking.

*Man's life is but vain;
For 'tis subject to pain,
And sorrow, and short as a bubble;
'tis a hodge-podge of business
And money and care
And care and money and trouble.
"But we'll take no care
When the weather proves fair;
Nor will we vex now that, it rain;
We'll banish all sorrow,
And sing till tomorrow,
And angle and angle again!"*

—The Angler's Song, an old round set by H. Lawes, 1653 and harmonized for four voices by J. S. Major, 1844.
(from The Compleat Angler)

Picnic--Anyone?

What's your choice—a sabre-toothed tiger or a few ants?

Both of these creatures have one thing in common—picnics. The tiger was an occasional visitor at the first picnics, 50,000 or so years ago, when the cavemen huddled around a fire and roasted fresh-killed meat. The tiger was attracted, of course, by the smell.

And ants? Well, they do show up now and then at modern picnics. But not enough to spoil the fun, for we know how to take care of them.

Nowadays, picnics are more fun than they used to be. For one thing, portable grills and coolers; disposable plastic knives, spoons and forks; colored paper plates, handy Dixie cups and other things take the work out

of outdoor eating. The food is more imaginative and varied. The clean-up is a snap. Using care, you do the dishes, when they're paper, with a match!

The Greeks had picnics 2,500 years ago. Naturally, they had a word for them—"contributor feasts." In London, in 1802, some fashionable people organized a picnic society. Before any outing, they would decide on a menu. They would draw lots to decide what each member would provide. But there was some dissatisfaction, probably disputes over who would furnish the expensive entree as opposed to the inexpensive items. Anyway, the Society was disbanded after only a year.

But the picnic idea caught on. Within 50 years, picnics were common. Some were large enough to feed



a hungry small-sized army. Following is a typical menu for a picnic-for-40 given by an English woman:

"A joint of cold roast beef, a joint of cold boiled beef, 2 ribs of lamb, 2 shoulders of lamb, 4 roast fowls, 2 roast ducks, 1 ham, 1 tongue, 2 veal and ham pies, 2 pigeon pies, 6 medium-size lobsters, 1 piece of collared calves head, 18 lettuces, 6 baskets of salad, 6 cucumbers."

Beverages included soda, ale and wine. As for utensils, you were advised to bring along good china and your very best sterling silverware.

This was status seeking—1861 vintage.

Meanwhile, Americans were coming up with their own kinds of picnics. The Pilgrims learned from the Indians and held clambakes. The Virginians learned from West Indian tribes and held barbecues with an entire ox as the bill of fare.

According to anthropologists, the clambake, the barbecue and the Hawaiian luau really date back to the superstitions of the primitive hunters. They invited the entire tribe to share their kill—not from generosity, but because they were afraid uninvited guests would hex their food!

What did your grandparents eat on their picnics? Some dishes were rather uninspired—like chicken sandwiches, stuffed eggs, and baked beans in relish. But a recipe book of 1915 also suggests sandwiches of cottage cheese and whole peanuts; cheese-sauce sandwiches; and something called "Ham sandwiches tartare"—minced ham, mayonnaise, tarragon, vinegar, mustard, minced parsley, capers, gherkins, onions, olives, and chopped fresh tomato, covered with watercress or nasturtium blossoms.

Recommended hot dishes included oysters a la king, lobster, and eggs Newburg—made at home and "turned into the hot thermos vacuum jar."

Patterned in 1907, the vacuum jar was the first in a long line of modern conveniences. There came also inflatable plastic cushions to sit on, straw roll-warmers, oak barrels holding four gallons of liquid, and paper cups, invented in 1909. Now you can even buy trays attached with spikes that are tapped into the ground to convert the tray into a little table.

All of which leads some people to the conclusion that picnics are getting too fancy. So what do they do? On a cold day, some of them take a rifle or fishing rod and march into the woods. After hunting or fishing, they light a fire and huddle around it cooking their fresh-killed meat, just like those cavemen of 50,000 years ago.

*How beautiful is the rain! . . .
It pours and pours;
And swift and wide,
With a muddy tide,
Like a river down the gutter roars
The rain, the welcome rain. . .*

From *Rain In Summer*, Longfellow

Let's Go Camping--

By
JOHN LIENHARD

Camping is an adventure, the biggest obstacle hurdled the minute you actually start on that first one-nighter. But, a little thought and preparation will add immeasurably to a pleasant, successful outing. Even a well-planned outing can be provocative if the camp site is not selected with foresight. My partner and I learned this the hard way.

My neighbor and outdoor companion decided on a three-day camping trip. We had, we thought, selected an excellent location beforehand. It was ideal in every respect, save one. We set up our umbrella tent on a sparsely timbered brow of a hardwood ridge, and near a spring, its water, crystal clear and cold. Although our luck was poor, everything went well until midafternoon of the second day. It became quite warm over the high part of the day so I decided to go back to camp, get a drink, and for a change hunt down the ridge. Within sight of the tent I saw something was amiss, but at the distance I could not see it clear enough to tell what was going on. I ran. And lo! the hindquarters of a black and white Holstein heifer was planted in the tent's doorway. The rest of her was inside raising hob. I twisted her tail but she didn't seem to mind. I called for help and my partner came on the double. Together we managed to get her out. But the mesh tent fly was badly torn, as well as several slits in the tent. She had pawed the sewed-in floor, but luckily the sod cushioned it and it had withstood her onslaught. The pay-off came when we checked the interior. We had camp cots, one along either wall, and in the center against the back wall a folding camp table on which we kept the grub and utensils. Taking stock we found that the black heifer had eaten the better portion of a large kettle of ham and beans, a half loaf of bread, two cakes of soap, and a pound of coffee! What she hadn't eaten she slobbered on.

After an hour's work cleaning and washing dishes we found the heifer standing beside the tent biding her time to again get in. We couldn't leave the tent unguarded, so we packed up and came home. Of course, our wives got next to it and we still hear about it occasionally. I believe you will understand when I say we have become pasture shy when it comes to picking a camp site.

There are three basic points to keep in mind when picking a safe and suitable camp site. They are location, pure water, and air and water drainage. Small matters to keep in mind, but they can mean the difference between a good time and possible serious trouble.

When considering location, always avoid large trees or timber, however safe and sound they may appear. In calm weather there is always the danger of a large



limb breaking off or a tree toppling. Look for small, open timber, or an open spot that is large enough to keep the tent out of reach of falling limbs or up-rooted trees.

Since we are concerned with camping in or near well-settled districts rather than wilderness areas the water supply deserves consideration. If the site is a public one, maintained by the state and with regularly tested wells or springs, you are all set. If on private ground and the available water may be from an abandoned well, or a little used spring, it is only good sense to play safe, the clearest water may be contaminated. Water purification tablets, with simple directions, are obtainable at most drug stores. They give the water an unpleasant taste, but it's better than taking the chance of serious illness.

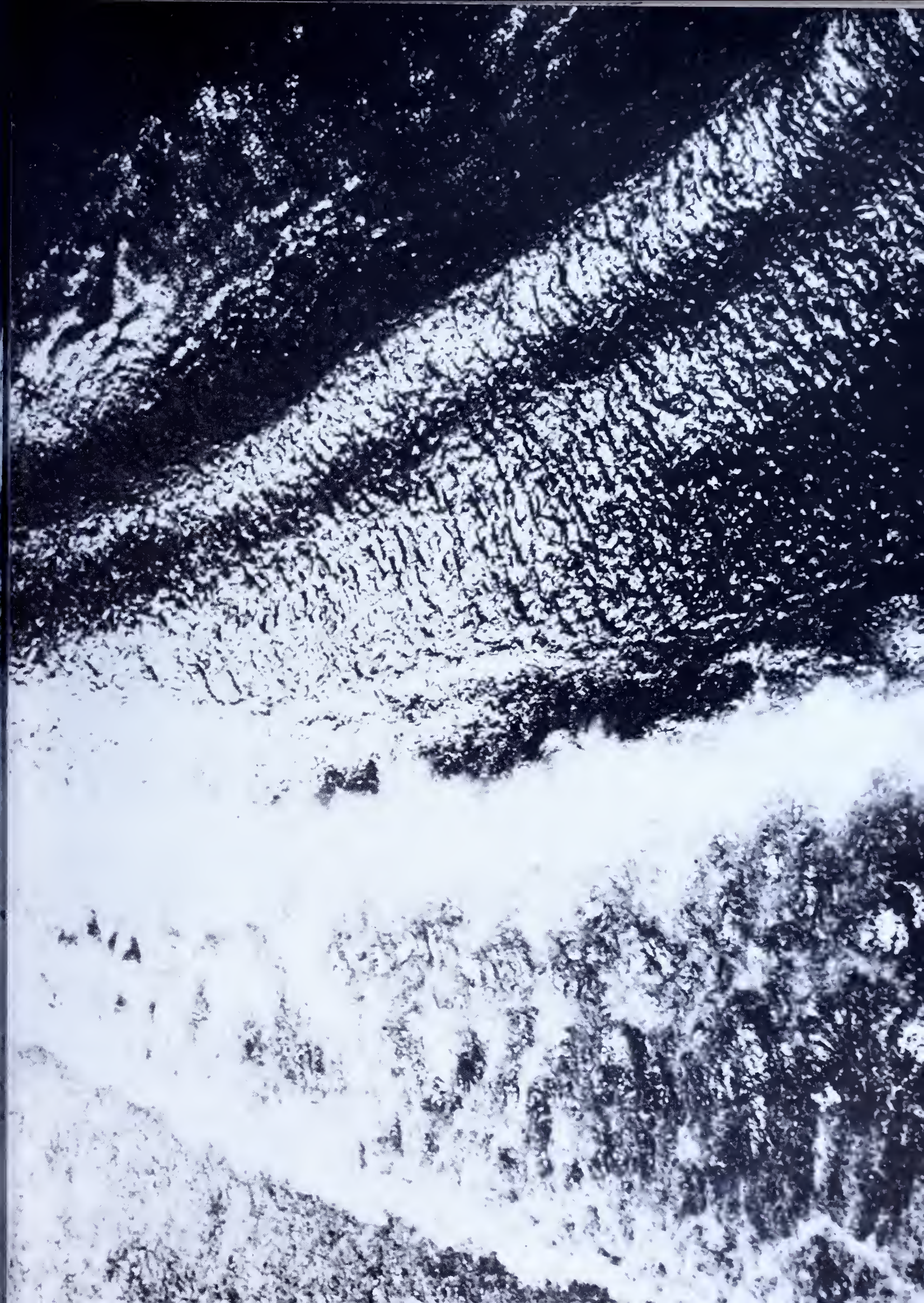
Water drainage is not as likely to ruin an otherwise good trip, but it is wise to take precautions and is worth the small effort. In clear weather, as well as bad, play safe and ditch around your tent or tarp. This requires

but a few minutes, and should be applied in such a manner as to lead the water away from the tent and away from the entrance side. It can save an uncomfortable wet interior if your weather forecasting should happen to miss.

Air drainage amounts to insect control, and cool, restful sleep in hot weather. Elevated ground has less humidity, more air current, and does not harbor the mosquitoes, flies, gnats, and the numerous other unidentified pests that campers have to take in stride. It is better to put up with a stiff breeze than to be eaten. Insects are the one nuisance the camper has to live with because their seasons coincide. Cool weather stops insects and is more comfortable for camping than mid-summer heat. For this reason fall is an excellent time for camping. A closed tent with mosquito proof net fly for ventilation is the common choice for the hottest months.

The size and shape of the tent is entirely a matter of individual preference. There is a rule applied to





determine the size that works well. That is, allow 17 to 25 square feet of floor space per person. So, a 5- by 7-foot size is suitable for two. Where transportation is no problem, such as the auto camper, the 7 by 7 or 6 by 9 would likely be favored by the majority of twosomes. Three or four persons will require a still larger size, particularly if the trip is to last more than a night or two.

The auto camper does not have the bulk and weight problem that the hiker, light boater and canoeist have. The latter face the necessity of shaving off every ounce of weight possible. Veterans always strive to lighten loads. The tent with ample headroom is most often selected by the auto camper. These are the wall tent, umbrella—sometimes called the marquee—and the baker. The baker is actually one-half of the wall tent. It has an open side, rather than end opening as the wall style. It is a favorite where a campfire in front of it is desired for warmth. It can be insect free with the addition of a net fly large enough to close in the open side. For those desiring the minimum and willing to give up headroom there are the pup, miner or tepee, cruiser and explorer models. The last two are so similar as to be considered one and the same for our purpose. I mention these small styles because there are a few who use them for auto camping.

Campers who feel it more sporting, get a closer to nature feeling from the small tents, use them only for sleeping and temporary shelter from rain. Their advantages are light weight, movability, quickly set up, taken down, easy to insect proof, and wind does not whip them as much as the larger tents. It is from these the hiker, canoeist and light boater picks his movable home. However, the large size cruiser tent, the front with headroom to stand and the back abruptly sloping, is a good choice for the autoist.

The tarp is a shelter worthy of mention for one-night trips. In 10- by 10-foot size, or larger, and made of light, water-repellent material, the tarp is adaptable to various methods of erection, but has never been too popular with auto campers. They do offer better protection than is commonly supposed and make an excellent substitute for the bulkier tents. The lacking element is insect protection, rather than weather protection. When set up as a lean-to shelter the tarp will reflect the heat of the campfire on the sleepers or sitters. A small tarp is sometimes carried and used for a ground cloth or floor.

I am partial to a sewed-in floor in my tents. It makes them cozier, and cleaning them is a small chore if care is taken. If you should hit a rainy night, or if on a more extended trip a rainy spell, it is quite likely you may find it difficult to keep it as clean as you would like. But with a tight, properly ventilated tent you can sleep free of worry about any crawling varmints.

Good rest is important to a successful outing, if only for a night. And the sleeping outfit is the one piece of gear that can make it so. Sleeping bags cover a wide range of quality and price. It is possible to get a bag of fair quality at a modest price, sufficiently warm, and

water-repellent. The filler materials for bags are down and feathers, wool, and kapok. The cheaper bags are usually kapok filled, but are inclined to become lumpy with use. If closely quilted the better ones will give satisfactory service for a long time. Wool is superior to kapok, but the better bags are filled with down mixed with a percentage of feathers. The price you pay is in ratio to what you will have. The down filled bags are light and warm. It is quite possible to get too warm a bag for summer camping. The lightweight bags are generally used in our territory for warm weather camping, and are sufficient for temperatures down to freezing. It is considered good policy to use a wool blanket filler inside the bag. The blanket absorbs moisture, is easily removed for airing, and means a shorter period of airing for both blanket and bag.

For years I used a blanket roll. It was cut and sewed by a local awning company, and made from a good quality material used by the armed forces. This, with two or three Army surplus blankets, I have spent many nights next to a good stream with only the stars for a roof. My children have used it to sleep in the back yard during the summer and fall. It does not, however, measure up to a bag. One point to remember in selecting blankets is that the soft, fleecy ones are warmer but do not wear as well as the tighter woven wool. I know mine are too hard for the most warmth, but they have withstood hard usage and are yet in good condition. One of these blankets makes a satisfactory filler for a bag.

Quilted pads for warmth and softer sleeping can be used with either a bag or roll. But an air mattress is superior and worth the money, especially if you sleep on the ground.

The auto camper can easily transport his gear, folding camp cots commonly carried. To sleep well on the ground you have to become used to it, however good your equipment. Cots are welcomed by the novice, or one who gets out so seldom he must be broken-in each time. It would be better to reduce the amount of other gear, if necessary, to take them along.

Cooking utensils and grub need not be the burden they sometimes become. You have only to observe some of the campers move basket, bag, and parcel and you will see the value of planning.



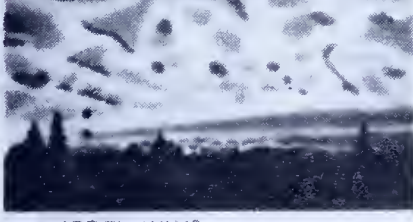




Cook kits to accommodate four, designed to nest together and weigh as little as five pounds, take the space of a small bucket, are available. Here too, you can cut expense and make several out of tins that will nest. Later you can invest when you know precisely what you want. Years ago I put a wire bail on a large tin can that was originally a prune can. This became a coffee pot. I have yet to taste any coffee as good as that we made in this can over an open fire. This tin soon took on the hue of a chunk of coal and will not wash off, it's well broken in, I assure you. A smaller tin with bail and an old frying pan made up the utensils we used for several trips.

A gasoline stove, either one- or two-burner, is a wonderful item. Its size is no burden to the auto

Weather Forecaster for Pennsylvania Campers, Picnickers, Fishermen

Clouds and wind are the signs in the sky which give the clues to coming weather

Directions: Observe entire sky and use photo which best matches your observation. Read across to correct wind direction (if calm, use west) and note forecast below.

WIND DIRECTION READ ACROSS →	NORTH	NORTHEAST	EAST	SOUTHEAST	SOUTH	SOUTHWEST	WEST	NORTHWEST
 CLEAR	Fair and Cool	Incr. Cloudiness	Incr. Cloudiness	Cloudy, Pos. Showers	Fair Weather	Fair and Warmer	Fair Weather	Fair Weather
 CIRRUS	Fair Weather	Incr. Cloudiness	Incr. Cloudiness	Incr. Clouds, Showers	Incr. Clouds, Showers	Cloudy, Pos. Showers	Fair Weather	Fair Weather
 ALTOCUMULUS	Little Change	Cloudy, Pos. Showers	Cloudy, Pos. Showers	Stormy	Showery and Warmer	Showery	Little Change	Clearing and Cooler
 ALTOSTRATUS	Little Change	Unsettled	Unsettled	Stormy	Showery	Showery	Pos. Showers, Clearing	Clearing
 NIMBUS	Slow Improvement	Stormy, Slow Improv.	Stormy Then Showery	Stormy	Slow Improvement	Showery Then Clearing	Showery Then Clearing	Showery Then Clearing
 SCUMMUS	Clearing and Cool	Showery	Incr. Cloudiness	Pos. Thunder-Showers	Thunder-Showers	Showers and Cooler	Possible Showers	Clearing
 STRATOCUMULUS	Clearing and Cool	Unsettled	Little Change, Stormy	Little Change	Showery	Showery	Clearing	Clearing, Cooler, Often Windy

camper and quick, hot meals can be prepared in a minimum of time. You can resume your fishing after a satisfying meal without the hustle and loss of time that are characteristic of open fire cooking. You, or a companion, must spend valuable time away from fishing to prepare grub. A gasoline stove will be appreciated though an open fire may be needed during the night. Aluminum foil has become quite popular with over-nighters who desire to dispense with all possible utensils. It is easy to use. But some practice is needed, especially for the novice who must learn to "read" his fire—enough heat to cook with, but not burn up the foil or utensils.

The grub for a night or two can be packed in a half-bushel basket. The hiker, of necessity, must select enough dried, powdered, and dehydrated foods to keep

down weight and bulk. While these are a good addition to the auto camper's fare, he is not restricted to this kind of food. It is much simpler to plan the few meals you will eat and pack canned and nonperishable foods to suit. A portable icebox is another welcome addition. This, too, can be dispensed with on short stays by those who like to keep the equipment to absolute necessities.

A word of caution and advice pertaining to firewood. When you secure permission from the land owner or tenant to camp on his property it is always advisable to have an understanding as to what you will burn. If there are trees down, or he allows you to cut a tree, well and good. Be sure you do not destroy timber that he values. At some public camp sites firewood is ready-cut by the caretakers.

Despite the importance of eliminating excess equip-



ment, there are several items necessary to camp life. The axe is the camper's tool. I suggest one of average to heavy weight. I found for an all-night fire it was quite a job to cut enough wood with my belt axe. So I removed the new 14-inch handle and fitted a slender 24-inch handle. It made a two-handed axe out of it, but it increased its danger potential. The lightweight head glanced so easily that it had to be swung with expert aim and not too much power. So for the unaccustomed axeman the heavier weight chopping tool, single- or double-bit as you prefer, would seem the safer choice.

The camper's saw is a competent substitute for the axe. Similar to the old-fashioned bucksaw, it is usually fitted with a blade of small size cross-cut teeth, and light enough for one-hand use, leaving the other hand free to steady the job. It is a fast, safe tool. The preference of either saw or axe is a matter of personal like and choice.

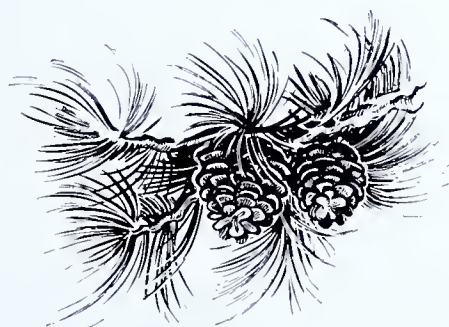
Two other important items are flashlight, or battery lantern, and first-aid kit. The first is such a common article that it is easy to forget. The first-aid kit is not used as often but should, nevertheless, be standard equipment. For snake-inhabited country, snakebite kits with rubber suction cups should always be along. Their cost is nominal, and they are small enough to be carried in a watch pocket. The cheapest life insurance anyone can buy.

An insect bomb to eliminate flying pests will add pleasure to your stay.

Probably the biggest deterrent to camping is the preparation. It appears to require considerable planning and effort. This planning can be a pleasant anticipation and the equipment problem made simple. The average home will have most of the articles necessary for a beginning. It is not good policy to use the best blankets and cooking wares from the home. But the needs of the overnight camper are few and the "not so good" household wares and blankets will do nicely for a start. To take gear that is not needed and never used is a common camping error.

Furthermore, there are excellent books on camping. All book stores will have some. Helpful and interesting are the Boy Scout and Scoutmaster handbooks. These are carried by stores catering to Scout equipment.

So, if you have always wanted to camp but have never gotten started, do set a date and when the time comes, GO! You will be glad you did. There is no better way to augment a fishing trip.



Now--Here's the Dope!

By

J. ALMUS RUSSELL

Smudges, dopes, insecticides, glazes, oils, and nets. All such insect repellents are readily procured and easily applied. Each fisherman or camper must decide for himself those which are the most effective and work out best in his own particular case. He must also make the best use of whatever materials he may have brought with him as well as of those provided by nature herself.

For the sportsman located in camp or on the shores of a pond, nothing is more available than the woodsman's smudge. For protection from fire and to conform with fire laws, he builds a small fire of dry twigs in a heavy iron pot. When the coals glow well, he covers them with a thin green sod, with green grass itself, or with punky wood found in a hollow tree or stump. Any of these will produce a dense smoke, driving away mosquitoes and black flies for the life of the fire.

A more lasting smudge will result from "cedar cigars." To make these, long strips of cedar bark are bunched together into a fagot from seven to eight inches in diameter. One dry strip is used for every two water-soaked strips. These strips are then bound with additional ribbons of green cedar inner bark. The ends of several such "cigars" are now lighted in the campfire before setting them up on different sides of the camp according to the wind. They will last the whole evening without replacement.

Smudges made from dried toadstools are very effective in keeping away the punkies ("no-see-ums"). In fact a large toadstool will hold the fire from six to eight hours.

Punkies are in reality tiny flying bloodsuckers. These woodland pests live beneath the bark of decaying branches, under fallen leaves, and in sap flowing from wounded trees.

Smoldering green birch bark, and dried cow dung with its pungent ammoniac odor are both excellent mosquito repellents. Insect candles, set deeply in glass "cups" to prevent the wind from blowing out the flames, make for insect-free out-of-door dining and relaxation. Dalmatian and Persian insect powders are effective insect remedies. Sometimes such powders are dampened, then molded into small cones. Such cones then may be burned with safety within the tent by placing them on tin lids or bits of green bark.

If insects make one's moments miserable within the tent, rub yourself thoroughly all over with oil of citronella. Then dress in the same clothes before resuming sleeping. Oils of camphor and of cloves, although less pleasant to the nose, may be used for the same purpose. While these odors are repulsive to some fishermen, they are undoubtedly to be preferred to the nuisance of the insects themselves. These oils may be renewed day

after day without any ill effects. They should be kept away from the eyes at all times.

Pieces of raw salt pork rubbed over the face, arms, and neck discourage mosquitoes and other insects. Crushed sprigs of pennyroyal and broken sassafras twigs are emergency wilderness insect repellents, particularly if bunches of either one are hung within the tent itself.

If one has already been bitten by flies, mosquitoes, or punkies, moist soap provides a most satisfactory remedy. The soap should be wet before it is generously rubbed on the punctures. If available, household ammonia, alcohol, glycerine, iodine, or even commonplace onion juice will also do the trick.

Thick ointments with a heavy tar, castor oil, or vaseline base are a must to keep away heavy insect swarms. These should be applied to the skin, left on for the period of the fishing trip without washing off, thereby making an impenetrable glaze. Such a glaze should be replenished a little each day in order to achieve the best results. The following "dopes" come highly recommended:

NESSMUK'S FLY DOPE

- 3 oz. pine tar
- 2 oz. castor oil
- 1 oz. oil of pennyroyal

Simmer all together over a slow fire and bottle for use in small containers.

FLETCHER'S INSECT GLAZE

- 1 oz. pure pine tar
- 1 oz. oil of pennyroyal
- 3 oz. vaseline

Mix all of the ingredients together *cold* and bottle for use.

A third mixture, recommended by an official of the Bureau of Entomology, United States Department of Agriculture, is particularly effective when used against black flies and mosquitoes:

Take 2½ pounds of mutton tallow. Melt and strain it. While the tallow is still hot, add ½ pound of black tar. Stir all thoroughly and pour into the receptacle which is to hold it. When it is nearly cool, stir in 3 ounces of citronella and 1½ ounces of oil of pennyroyal.

Such tar glazes work well in comparatively cool weather. However, when it is hot enough for the body to sweat freely both day and night, the glaze cannot become permanently established. In addition, warm rains may wash it off or the mixture may rub off on clothes and fishing gear, hence the fisherman may do better by using a variety of oils, even though they have to be renewed every hour or two.

The difficulty with such oils, however, is that they evaporate all too quickly. To retard such evaporation, add two or three times as much castor oil to the other oils used as castor oil is a natural insect repellent.

The following oil "dopes" have been found very effective by camping enthusiasts:

FLY DOPE OIL

- 1 oz. oil of pennyroyal
- 2 oz. white tar oil
- 3 oz. castor oil

Mix ingredients *cold* and bottle for use.

NASH'S INSECT REPELLENT

- 1 oz. oil of citronella
- 1 oz. spirits of camphor
- ½ oz. oil of cedar

Mix ingredients *cold* and bottle for use.

FOX'S INSECT REMEDY

- | | |
|-------------------------|----------------------|
| ½ oz. oil of pennyroyal | ½ oz. oil of quassia |
| ½ oz. oil of peppermint | 2 oz. gum camphor |
| ½ oz. oil of bergamot | 1 oz. vaseline |
| ½ oz. oil of cedar | |

Dissolve camphor in vaseline by heat. When cold, add remainder of the ingredients. Bottle for use.

Finally, come the insecticides which poison all of the pests directly. Old wood such as beams, floorboards, and shingles may be painted with creosote. Tincture of Labrador tea (*Ledum palustre*) and oil of cassia (cinnamon) have been found to be excellent insect irritant poisons long after the mixtures have dried. Carbolic acid combined with sweet oil in the proportions of one to sixteen is often used where the common application of insecticides has seemed to be ineffective. And a 5 per cent solution of sulphate of potash has even prevented mosquitoes from alighting on the body.

Plain kerosene is death to insects that have not burrowed beneath the skin. It is less unpleasant to the nose and less harsh on the skin when mixed in the proportions of one part of oil of bergamot to sixteen of kerosene. In addition, the bergamot gives the kerosene enough body to make the mixture last for half a day or longer without evaporation.

If dull or cold weather forces the fisherman to occupy temporarily an old house, shack, or lumber camp, he must watch out for ants and bedbugs. Both pests are likely to be found in such habitations even though the former owners have long since departed. Kerosene sprinkled around walls, ceilings, and floors is about the only sure remedy except fumigating for getting rid of these bugs.

Nets are a necessity in an insect-infested region. All tents should have a curtain of fine cheesecloth to exclude flies and mosquitoes. This should be made so that it may be attached or detached at will. In addition, tents that are to be closed at night should be fitted with screened windows to insure good ventilation. The well-equipped fisherman will also provide himself with a fine-meshed head net, in addition to his using a standard insect repellent rubbed on the hands and arms.

The fisherman who makes his trip well-fortified against all flying, creeping, and burrowing insects will return not only with a better catch but with improved health as well. An ounce of prevention is worth a pound of cure.

Public Boat Launching Ramp At Martin's Creek Opened By Penna. Power & Light Co.

Executive Director Day Launches First Craft

At a special ceremony on May 9, officials of the Pennsylvania Power and Light Company announced the opening of a public boat launching ramp and car parking area south of and as part of the Company's Martin's Creek power plant operations, about 10 miles above Easton on the Delaware River. This facility will be maintained by the PP&L and will be open to the general public at no charge.

The area contains a concrete ramp extending into the river on which boat trailers may be backed for unloading. The beach and adjoining ground is covered with crushed stone so there is no possibility of bogging down while moving the boat trailer in or out of the water. The surrounding underbrush has been cleaned out from under the big trees and picnic benches are available for "snacks." Just above the beach is a large parking area and a small booth for registering your fish, if so inclined. The Delaware produces some nice fish as evidenced by the 25½-inch, 7-pound brown trout pulled out of the river the same day as the ceremony. Bait used was a spinner-minnow combination.

Attending the ceremony were some 40 persons including Albert M. Day, Executive Director of the Pennsylvania Fish Commission; Raymond M. Williams, member of the Fish Commission; Cyril G. Regan, Chief, Division of Real Estate; Robert J. Burns, District Conservation Officer, Blairstown, N. J.; John Linaberry, Bangor, Pa.; John O'Dowd, District Conservation Officer, Washington, N. J.; John S. Ogden, Southeast Regional Fish Warden Supervisor; Louis A. Sipos, Secretary, Lower Mount Bethel Township Rod and Gun Club; Dr. Roland F. Smith, Bureau of Fisheries Laboratory, Division of Fish and Game, Lebanon, N. J.; Charles E. Uhler, Secretary, Stockertown Rod and Gun Club; Arlington Vrontisis, Roseto Rod and Gun Club; Harold W. Wiggins, Secretary, Lower Nazareth Rod and Gun Club; Miles D. Witt, Fish Warden, Northampton-Bucks Counties; John Hoffman and Ralph Blessing, Real Estate Division, Pennsylvania Fish Commission; Harvey R. Frantz, Outdoor Editor, Bethlehem Globe Times.

PP&L REPRESENTATIVES—W. S. Brokenshire, Vice President, Engineering and Construction; H. M. Schelden, Vice President, Lehigh Division; J. S. McKelvey, Superintendent, Martin's Creek Steam-Electric Station; E. S. Mathers, Superintendent of Buildings; E. W. Smith, Assistant Vice President, Public Relations; E. L. Somers, Technical Assistant to Vice President, Operating; A. C. Thomas, Senior Staff Engineer; R. Van Vliet, Civil Engineer; J. W. Crawford, Director, Institutional Advertising and Publicity; J. H. Moore, Advertising Assistant.



EXECUTIVE DIRECTOR, Albert M. Day, Pennsylvania Fish Commission, launches first boat at opening of public boat launching ramp and parking area at Martin's Creek, about 10 miles above Easton on the Delaware River.



AT LAUNCHING SITE (left to right): John Linaberry, Blue Mountain Rod and Gun Club; Hon. Raymond M. Williams, Member, Pennsylvania Fish Commission; T. T. Torek, Assistant Superintendent, Pennsylvania Power and Light Company; Harold Wiggins, President, Northampton County Federation of Sportsmen's Clubs; and Miles D. Witt, District Warden, Northampton-Bucks Counties, Pennsylvania Fish Commission.

H. M. Schelden, Vice President of the utility's Lehigh Division, told guests that the facility is being made available to local sportsmen as a public service by PP&L. He said that, whenever and wherever possible, PP&L attempts to develop its facilities with an eye towards recreational opportunities for the public. "We feel that we have a responsibility for all-around good citizenship in the area we serve," he said, "and this is one of several ways in which we try to meet that responsibility."

The Martin's Creek boat launching ramp is one of two that the Company is presently providing for the convenience of the public. The other, presently under construction, is located on the Susquehanna River at Lake Aldred, which is formed by the dam at PP&L's Holtwood hydroelectric station. Also on the Susquehanna just above Lake Aldred is Lake Clarke, formed by the dam of the Safe Harbor hydroelectric plant. A boat launching ramp is also available at this lake, provided by Safe Harbor Water Power Corporation of which PP&L is part owner.

—Harvey R. Frantz

Observe National Safe Boating Week

From canoe paddler to yachter the 1961 observance of safety afloat is important!

America's more than 40,000,000 pleasure boaters have added a new dimension to the traditional celebration of Independence Day. National Safe Boating Week is becoming as accepted a part of the 4th of July scene in many American communities as red-white-and-blue bunting, box lunch picnics and oratory by local politicians.

President John F. Kennedy, himself an ardent boater, sums up the reasons why in the proclamation of the national observance:

"Whereas increasing numbers of our citizens are participating in boating for health and relaxation; and, whereas continued cooperation among persons and organizations interested in boating is necessary to maintain our steady progress toward the ultimate goal of courteous and safe boating throughout the year:

"Now, therefore, I, John F. Kennedy, President of the United States of America, do hereby designate the week beginning July 2, 1961, as National Safe Boating Week; and I urge all persons and organizations interested in recreational boating, and the boating industry, government agencies, and other groups, to observe National Safe Boating Week."

As most boatmen know, despite the tremendous increase in boating, there has been no significant increase in boating accidents. In fact, there was a drop in the number of boating fatalities during 1960.

A good part of the credit for this remarkable safety record must go to the organized groups that devote time and energy to boating safety and education.

Your Checklist for Boating Safety

Millions of Americans have discovered a new world of fun on the nation's waterways. Boating is even more fun if the skipper, his mate and the whole crew know their craft is properly equipped. Here's a checklist on the items of boating equipment recommended by marine safety experts. How does your boat check out?

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> Life preserving device for every passenger | <input type="checkbox"/> Anchor |
| <input type="checkbox"/> Proper lighting | <input type="checkbox"/> Line |
| <input type="checkbox"/> Horn or whistle | <input type="checkbox"/> Compass |
| <input type="checkbox"/> Fire extinguisher | <input type="checkbox"/> Fenders |
| <input type="checkbox"/> First-aid kit | <input type="checkbox"/> Bilge pump |
| <input type="checkbox"/> Tool kit | <input type="checkbox"/> Paddle |
| <input type="checkbox"/> Gas can | <input type="checkbox"/> Flashlight |



Common Sense, Safety Are First Considerations for All Boatmen

Concern for the safety of companions should be uppermost in the mind of any boatman at all times. Carelessness has no place in recreational boating. Common sense will override carelessness in any experienced boatman, and the novice will do well by being overly cautious until he gains the knowledge that comes only with experience.

Only carelessness or lack of knowledge allows a boatman to operate his craft without providing proper life preservers for his companions and himself; without proper safety devices according to the size of the boat.

This is to remind boatmen that there is more to safe boating than simply following the dictates of local or state boating laws.

The first safety precaution to observe is to take stock of your boat. If it has metal trim strips, make sure the trim has not lifted, leaving sharp edges on which the unwary might suffer a nasty gash. Even the most careful of builders might inadvertently leave a sharp, unfinished edge protruding somewhere. Make sure your mooring hardware is mounted so that it does not interfere with persons boarding or leaving the boat. If the cockpit floor is unusually slick, it may be a booby trap for the unwary.

Your steering hardware, pulleys and cables should be periodically checked so that you run no risk of suddenly losing steering control when underway. Small outboards often have no special place for stowage of the anchor. Be certain it is stowed in a spot where rough water will not cause it to become dislodged and injure some passenger. Stow your gear neatly so there is no

possibility of boat passengers becoming entangled in it either while boarding or when underway.

If the boat is shipshape, there are common safety precautions to observe in and around it. Board sensibly by stepping as nearly as possible amidships in a small boat, keeping the body low and the hands and arms free. Stow equipment after you have boarded. Give a helping hand to others boarding your boat.

It's strictly common sense, and the law in most cases, that you have a life preserver aboard for each person in your boat. Check to see that your other safety equipment, such as fire extinguisher, emergency paddle and lights are in operable condition.

Keep your load within the safe carrying capacity of the boat, whether the load is passengers or cargo. Balance the boat load properly for safety and efficient operation. Keep passengers seated on the seats, not on the gunwale or deck. One of the major tendencies is to overpower a small boat. Too big a motor can make your boat dangerous to operate.

Whenever you are out in a boat, watch the weather and respect it. If caught in a storm, keep the passengers low and, if possible, head into the waves at low speed to reach shore. If your boat should ever capsize, stay with it and depend upon its built-in buoyancy.

You invite trouble if you launch in swift waters or near a dam or waterfall. If you leave a pier with a current running, always have your motor started before casting off. Proceed at low speed in harbors or anchorages or when passing close to swimmers, fishermen or other boats.

Follow the marine "rules of the road" when underway. Stay alert for obstructions, especially when in unfamiliar waters. Watch your wake; you are legally responsible for any damage it might cause.

Safety afloat is basically courtesy and common sense. The combination of the two seldom fails.

Remember! Boats Don't Have Brakes

One of the most common causes of boat damage occurs when the boat driver bumps into a pier, shore or other obstacle because he does not accurately judge the distance it will take for the boat to coast to a stop from a given speed.

The only brake on a boat is the reverse gear and only an experienced boat handler has learned to use this effectively. So when driving a boat, determine how far your boat will drift when the power is cut at any given speed. Select a fixed marker in open water and make a few trial runs to get the approximate distance needed for the boat to stop at various speeds.

If your outboard motor will not idle properly it may be the low speed carburetor needle is improperly set, the spark plugs may be defective or you might have the improper fuel mixture.



Photo Courtesy Evinrude Motors

CHANGING SEATS like changing horses in midstream is extremely tricky! And . . . it's a good way to lose a passenger overboard. A good skipper won't permit it because safety dictates persons aboard a small boat remain seated on the seats while boat is moving!

Outboards Don't Steer Like Autos

When you are getting away from a pier or float, don't spin your wheel so far in one direction that the stern swings sharply against the obstruction, says Everett B. Morris in "Outboard Boating Skills."

Morris says to remember that outboard boats do not steer like automobiles or bicycles, which follow their front wheels. In boats, the stern responds to the steering impulse first and in the opposite direction from that which the bow is going to take. So, when you are in close quarters, give your stern room enough to swing when you turn.

Watch That Key!

Many boat excursions have been spoiled because the ignition key was accidentally dropped overboard. To prevent loss of keys while boating they could be attached to a small fishing bobber or other floating device.

Take Plenty of Line When Going on Cruise

Before leaving on your next cruise, make up a spare line or two and take it with you.

A bow, stern or anchor line may either be lost or used for some other purpose . . . so extra line comes in mighty handy.

To prevent unnecessary grief en route, make a check of all lines before leaving on a cruise. A little extra work before the cruise will save a great deal of time, time that could better be spent enjoying your cruise.

Large Crowd at Linesville Hatchery Open House

By **KEN WILLIAMS**
Outdoor Writer, Meadville Tribune

The Pennsylvania Fish Commission's program of producing and rearing warm-water fishes was put on public display in a colorful open house at the big Linesville Hatchery on a recent Sunday afternoon.

Aided by a major boost from the Weatherman, who came up with this season's brightest day, the Commission played host to an estimated 1,200 to 1,500 persons during a busy afternoon commencing at 1:30 p.m. and ending well after 5 p.m.

The participants came from all sections of Western Pennsylvania, as well as farther afield, in an estimated 400 private automobiles which at midafternoon taxed parking facilities at the hatchery on the shores of upper Pymatuning Lake. At one time more than 350 cars were counted by attendants—and they kept coming in all afternoon.

An Impressive Show

What the visitors saw at the hatchery in a few hours must have been impressive to all, but particularly to the fishermen who prefer the warm-water fishes—the muskellunge, the pike, the pan fish, in particular.

With S. Carlyle Sheldon of Conneautville, Northwest region supervisor, acting as master of ceremonies from a loud-speaker stand on a western hillside, the crowd of men, women and children was given an extensive tour of the hatchery system as well as a vivid demonstration of fish culture techniques.

After a brief introductory talk by Sheldon and a briefing on the hatchery by J. L. Zettle, its superintendent, the spectators witnessed these demonstrations:

1. The use of electro-shocking gear in collecting fish from hatchery waters;
2. Taking fish gathered in by nets set in waters of the sanctuary, or hatchery lake;
3. Use of hormones (pituitary glands from carp) in inducing spawning by brood muskellunge;
4. Anesthetizing brood fish and removal of eggs for musky culture;
5. Identification of warm-water fishes;
6. Demonstration of various types of nets.

Big Brood Fish

Attracting most interest, perhaps, were the electro-shocking and brood fish demonstrations.

In the one, regional fishery Manager William Daugh-

erty of Conneautville and several aides dragged electrified fishing gear through a hatchery pond to shock a number of fish for netting.

In the other demonstration hatchery employes under direction of Superintendent Zettle took big brood muskies from the hatch house, anesthetized them and "milked" them of their eggs. Some of these big females—there were 16 in the tanks—range up to 44 inches in length. After their eggs have been removed they are returned to the main Pymatuning Lake for public fishing.

Fish on display in the commission's portable identification exhibit included: muskellunge, great northern pike, yellow perch, white bass, channel catfish, brown bullheads, black crappies, largemouthed bass, white bass and carp.

Nets used in the warm-water fish program were displayed in a setup on the lakefront, including trap and fyke nets, drag seines and gill sets. Commission officials said two large display ponds where fish may be viewed regularly by visitors are to be built this summer on the lakefront area occupied by the display of nets.

Top Personnel Present

Besides Zettle and most of his 14 hatchery employes, and Daugherty, other Fish Commission employes taking part in the demonstrations included research biologist Keen Bus and assistant biologist Jack Reddecliffe, both of Bellefonte Hatchery.

Other top Fish Commission personnel present included: J. M. Critchfield of Somerset County, chairman of the commission's fish committee; Minter C. Jones, warden supervisor, and DeWayne Campbell, fishery manager, of the Southwest region at Somerset; Sheryl Hood, manager of the Erie Hatchery; and Russell S. Orr of Harrisburg, chief of the division of public relations and conservation education.

Fish Commission President Wallace C. Dean of Meadville, who has been largely instrumental in sponsoring the commission's warm-water fish culture program, was out of town on business and unable to attend.

The event also attracted a number of officials of the Pennsylvania Federation of Sportsmen's Clubs and officials and committeemen of Meadville and other clubs in Crawford County.

G. Stewart Hoffman of Meadville provided loud-speaker outfit for the occasion.



WILKES-BARRE VETERAN'S HOSPITAL patients use lures for cures in background at Commissioner Raymond M. Williams' Green Walk Trout Hatchery, Bangor, Pa. Amvets and Pennsylvania Fish Commission personnel cooperating in the program were: First row (l-r): Commissioner Williams, James Yoder, District Fish Warden; Russell Orr, Chief, Conservation-Education, Public Relations, Pennsylvania Fish Commission; Walter Burkhardt, District Warden; Miles Witt, Norman Sickles, District Fish Wardens; Johnny Nicklas, Pennsylvania Fish Commission Photographer, is in foreground. Second row: Andrew Ondish, Dave Kaspar, Steve Migus, Paul Kern, John Perhach, Frank Mackiewicz, Earl Detweiler, Amvets Service Officer; George Forrest, Editor, **PENNSYLVANIA ANGLER**, Pennsylvania Fish Commission; Warren Singer, Assistant to Executive Director, Pennsylvania Fish Commission; John S. Ogden, Southeast Regional Warden Supervisor of the Commission; Dr. M. L. Konecke, VA Hospital physician. Third row: Eugene Boylan, Chief of Recreation at the VA Hospital; and Clair Fleeger, Northeast Warden Supervisor, Pennsylvania Fish Commission.



Commissioner Raymond M. Williams Hosts Wilkes-Barre Veterans Hospital Patients

Fish Commissioner Raymond M. Williams threw open his Green Walk Trout Hatchery at Bangor, Pa., to a group of patients from the Veteran's Hospital at Wilkes-Barre for a day of fishing on May 24, 1961.

Under sponsorship of area Amvets organizations in cooperation with Pennsylvania Fish Commission personnel, the veterans group traveled by bus to the Bangor site. The men are mental patients at the VA hospital and the program was planned as a part of the rehabilitation program. The program was started last year by the Amvets, story appeared in the January, 1961, issue of the **PENNSYLVANIA ANGLER**.

Dr. M. L. Konecke, of the VA Hospital, found the outdoor program very beneficial to the patients. Earl F. Detweiler, Jr., national service officer of the Amvets, said that reports sent to his headquarters showed that the program was well accepted by the patients and the administration. He added that VA hospitals located in other states are watching developments of the program and have made plans to start the same project in their hospital.

The Vets caught 256 trout, cleaned their fish, put them in an ice chest, took them to the hospital where a fish dinner was served.

Fish Commission Honors Game Commission Division Supervisor Carl C. Stainbrook

Pennsylvania Fish Commission members Ray M. Williams and Maynard Bogart attended a testimonial dinner on May 20 to Carl C. Stainbrook, Division Supervisor, Pennsylvania Game Commission, at Wilkes-Barre. Commissioner Gerard Adams was toastmaster and Warren Singer, Assistant to the Executive Director, presented Mr. Stainbrook with a gift as a token of the Commission's esteem. Others attending the dinner and presenting citations were: B. K. Williams, past member, Pennsylvania Game Commission; Andrew C. Long, member, Game Commission; Oscar Becker, president, Izaak Walton League; Peter Murray, president, Northeast Division Pennsylvania Federation of Sportsmen's Clubs; Maney Gordon, Department of Forests and Waters; Ross Leffler, speaker, Former Asst. Secretary of the Interior Regional District National Wildlife.



—Photo by Johnny Nicklas, Pennsylvania Fish Commission

AT TRI-STATE MEETING (Not in order in photo): Dr. A. H. Underhill, Director of New Jersey Fish Commission; Harry Grosch, Roland Smith, Robert Hayford, Dick Gross, Henry Kelly, New Jersey Department of Conservation; Earl Walker, of the Federal Fish and Game, New Jersey; C. W. Greene, New York; Eli L. Dietsch, William Coffin, Carl Parker, Warren McKeon, Kenneth Wich, New York Department of Conservation; Raymond M. Williams, Member, Pennsylvania Fish Commission; Dr. Albert S. Hazzard, Assistant Director, Pennsylvania Fish Commission; William Britton, Miles Witt, Walter J. Burkhardt, Joseph E. Bartley, Cyril G. Regan, Harland F. Reynolds, Gordon Trembley, John O. Hoffman, Terry D. Rader, Clair Fieeger, John S. Ogden, Johnny Nicklas, Fish Commission Staff; Francis Trembley, J. A. Mihursky, Lehigh University, Bethlehem, Pa.; William J. Moore, Delaware.



Representatives of the Pennsylvania Fish Commission, New York Conservation Department, New Jersey Division of Fish and Game, the Delaware Board of Fish and Game Commissioners, and the U. S. Fish and Wildlife Service met May 22-23 at Port Jervis, New York, to coordinate fishery regulations and investigations for the Delaware River.

The proposed Delaware Basin Compact, which already has been approved by three states and is under consideration in Pennsylvania and the U. S. Congress, would change the format of future meetings. If ratified by the four states and Congress, the Compact will form the first federal-state compact managing an entire river basin.

The meeting included discussions of the Compact, progress reports of the biological and chemical studies of the tri-state survey, and a survey of access sites for fishermen and boaters. Hunting and fishing regulations were also discussed.

Biological investigations backed up by excellent fishing reported during recent weeks, have shown that some top angling awaits fishermen who frequent the river. The studies have revealed that both the smallmouthed bass and walleye populations are expanding. The fish are growing in both numbers and size. Excellent trout populations have been recorded in the upper river between Calicoon and Hancock. The shad fishing is reported to be the best in recent years.

The Pennsylvania Fish Commission was represented at the meeting by Dr. Albert S. Hazzard, assistant executive director; Gordon L. Trembley, chief aquatic

biologist; W. W. Britton, chief law enforcement officer; Cyril Regan, chief of the Real Estate Division, and field personnel directly concerned with the area.



RETURN OF THE SHAD to the Delaware River gave excellent sport to anglers from above Narrowsburg to Morrisville on the lower river reaches. District Fish Warden Joe Bartley shows samples averaging 18 inches in length and 36 ounces in weight. The 1961 migration of shad was largest of modern times.



Storm over Lake Wallenpaupack by Johnny Nicklas





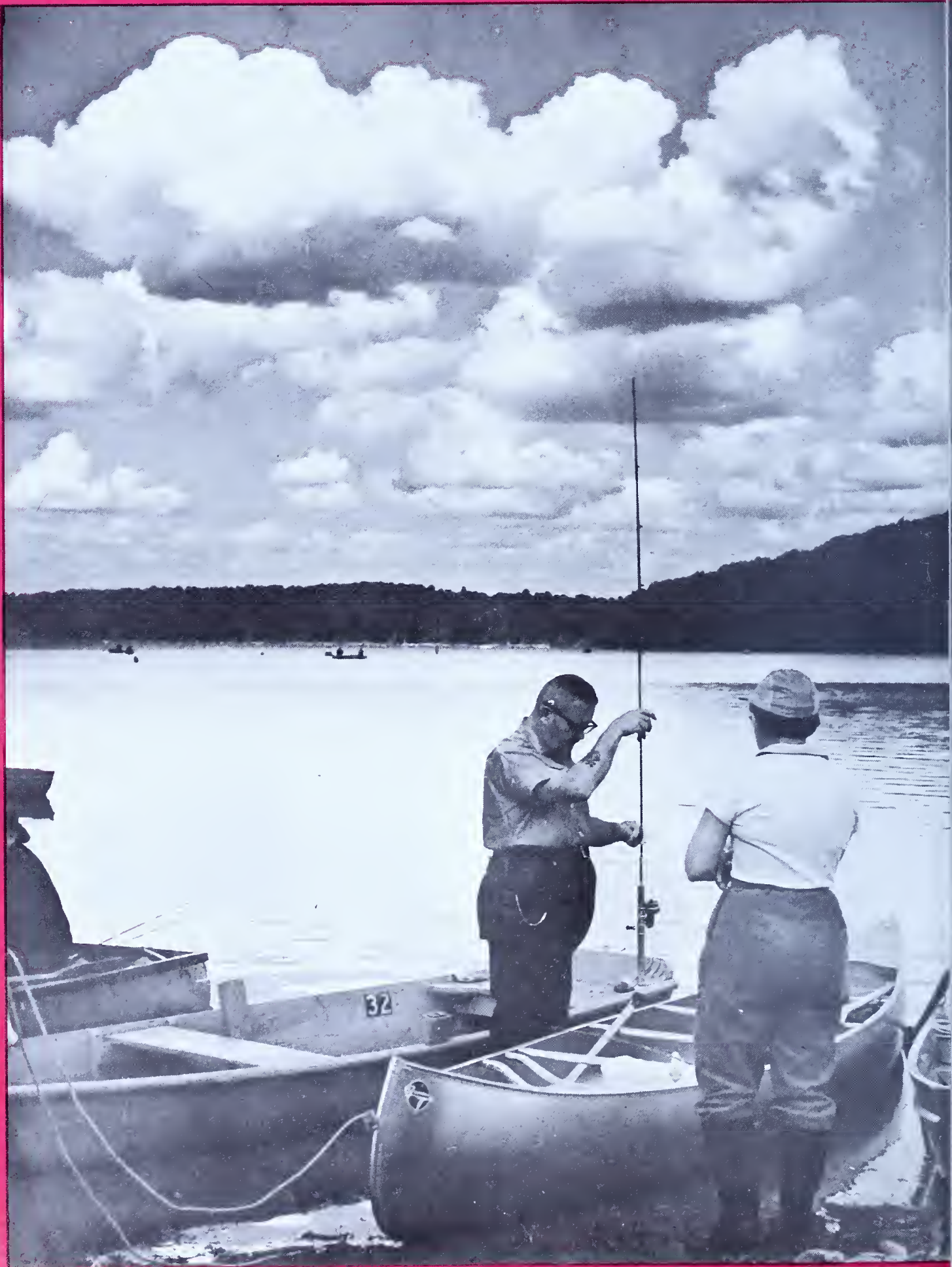
Pennsylvania

Angler

August

1961





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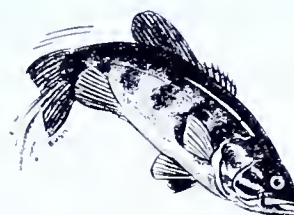
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RAYMOND M. WILLIAMS .. East Bangor



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JOHNNY NICKLAS, Photographer

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Cover art by Ned Smith and Bob Cypher

Inside cover photos by Johnny Nicklas of Belmont Lake Opening Scenes

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Susquehanna Fishways Studied at Bonneville Lab

Designed to study the migratory habits of fish, these huge West Coast facilities are being used by experts Bell and Holmes seeking to solve fishway problems at Susquehanna River dams.

By RUSSELL S. ORR, Chief

**Conservation Education Division
Pennsylvania Fish Commission**

The Pennsylvania Fish Commission a few months ago entered into a contract with two of the world's leading experts on fish passage problems. They are Milo C. Bell of the State of Washington, and Harlan Holmes of Oregon. The contract is for "not to exceed \$75,000" to study fish passage problems at Conowingo, Holtwood and Safe Harbor Dams on the Susquehanna River.

The contract with engineer Bell and biologist Holmes calls for the development of plans for fish passage at these structures.

While shad are the principal anadromous fish species—eels, catfish, walleye and striped bass are involved in the program. By June 1, 1961, less than \$5,000 of the fund had been expended. Bell and Holmes are paid on a per diem and actual expense basis.

Original planning called for the construction of certain experimental facilities on the Susquehanna Dams. Investigation by Bell and Holmes revealed that the facilities of the huge \$500,000 Federal experimental laboratory just below Bonneville Dam on the Columbia River could be used for obtaining data to be applied to the Susquehanna River project. They found that nearly any conditions ever likely to exist on the Susquehanna could be simulated at Bonneville.

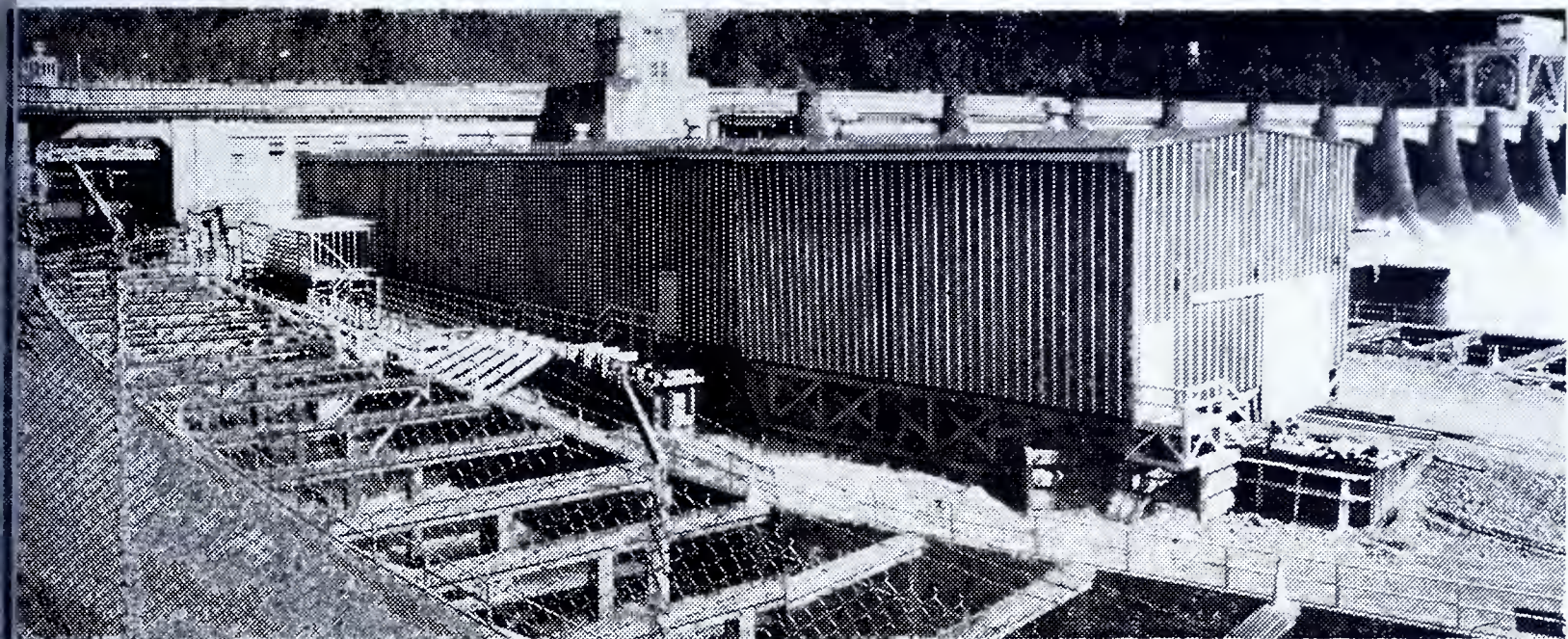
The Bonneville laboratory was designed to study the migratory habits of fish under different conditions. Factors are controlled at will. Here the effects of water velocities, light, electricity, chemicals and other stimuli are studied. In a closely allied laboratory at Willard, Wash., physiological and chemical changes in a fish tissue can be studied to determine basic reactions resulting from the various experiments.

Shad were used for the experiments at the Columbia River dams. They were tested under various conditions with particular emphasis on those experiments which would reveal the maximum speed of water flow which could be overcome by the species.

"We used the shad for our experiments because it is known that fish passages which can be used by shad are more than adequate for any other kind of fish to be found in the Susquehanna," said Bell.

The shad, by the way, were the progeny of eastern shad transported from New York to the Sacramento River at Tehama, Calif., in 1871. Seth Green shepherded four eight-gallon milk cans containing 12,000 hours-old shad fry from the Mulls Fishery on the Hudson River near Albany, to their new home on the West Coast.

The eastern shad spawned in their new home in the

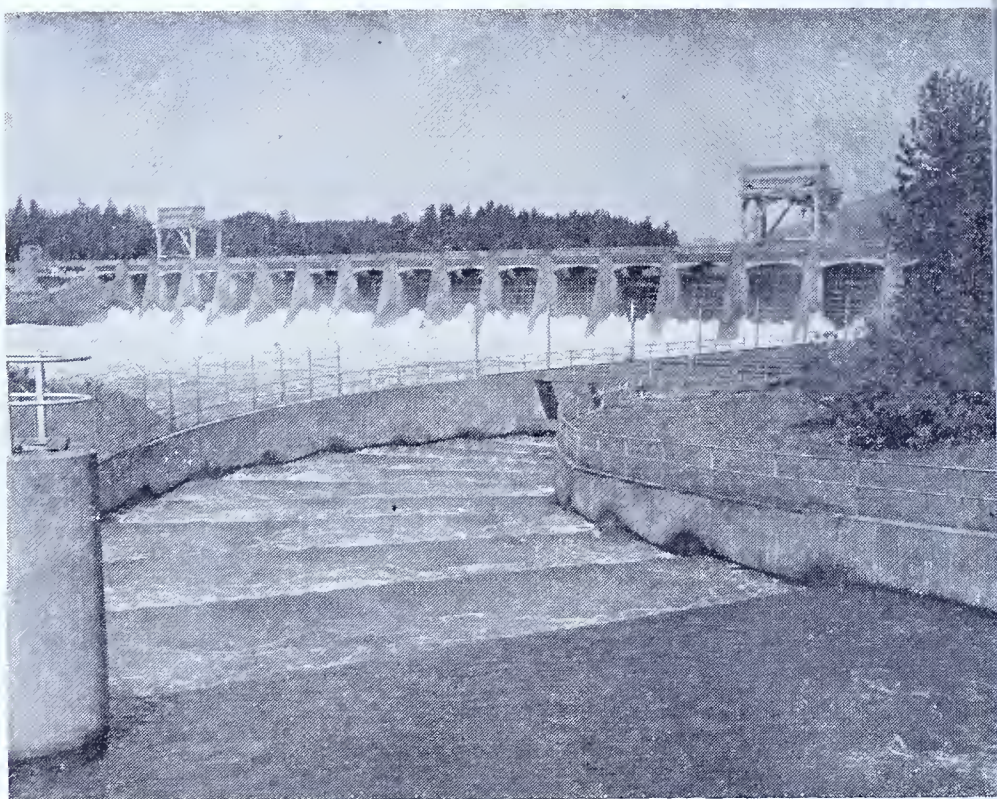


CONNELVILLE LAB facilities of huge \$500,000 Federal experimental base is available to Bell and Holmes in their Susquehanna River fishway passage problems.

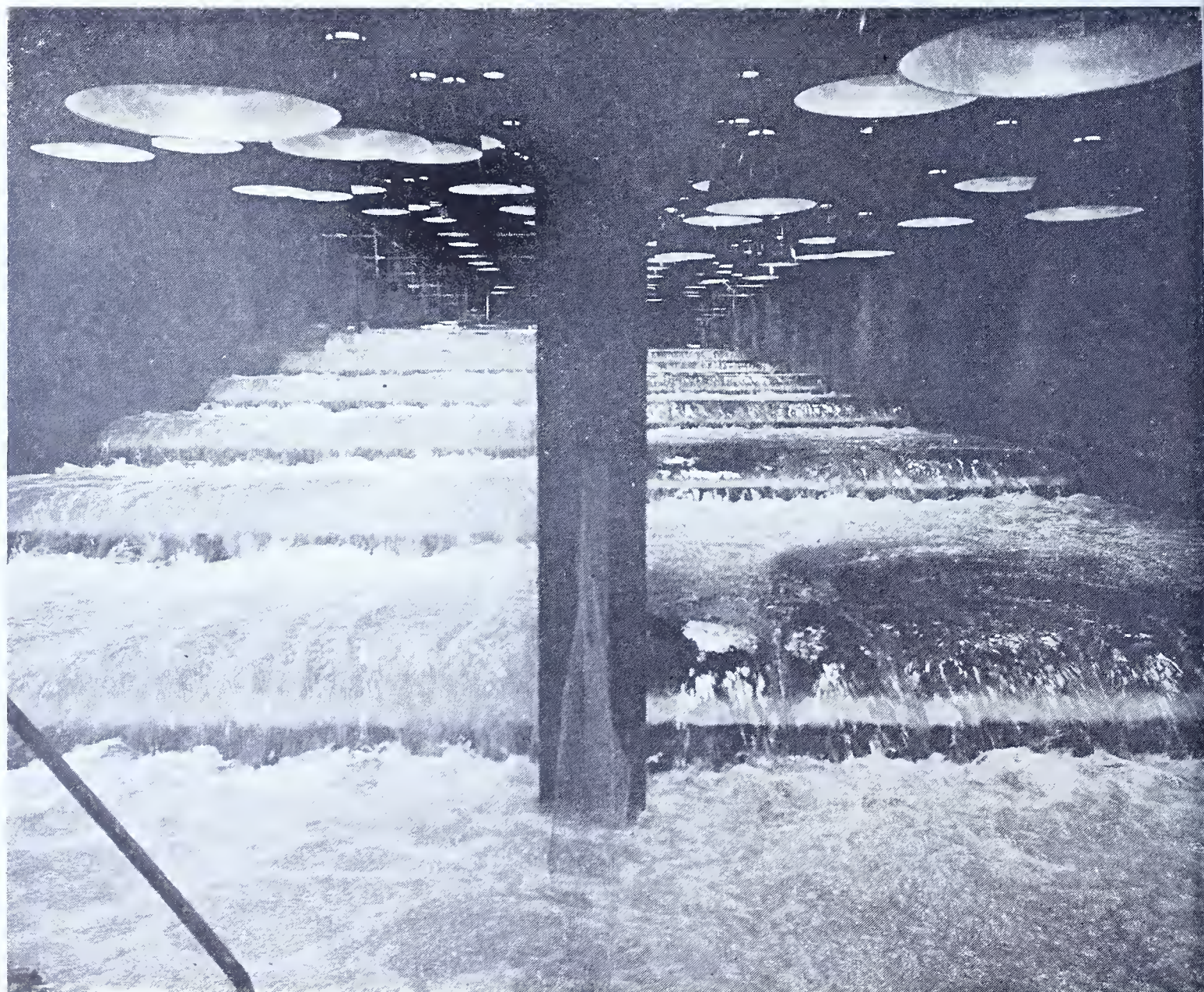
INTERIOR VIEW of the big experimental laboratory showing ladders, lights and other electrical devices.



BONNEVILLE LADDER at Bradford Island designed for migratory fish.



LIGHTS ON! At night ladders under the lights look cool.



West. Soon they had spread beyond the Golden Gate to other Pacific Coast streams and by 1876 had spread northward to the waters of the mighty Columbia. Now the umptieth generation of these shad that passed through Pennsylvania on their way west 90 years ago, are being used as "guinea pigs" to guide us in our attempts to restore shad runs on the upper Susquehanna and to preserve them on the Delaware.

A screened holding pond at Tanner Creek in Oregon near the dam was made available for the experiment by the Oregon Fish Commission. There the observers were able to study shad movements, recovery from anesthesia treatments and other experiments which were a part of the overall study.

Huge aerated tank trucks used for hauling both adult and fingerling salmon around dams in the Northwest were made available to see whether shad would respond to the same treatment. A large circular pool on the grounds of the University of Washington at Seattle was used to test shad endurance and swimming ability under controlled conditions.

While the bulk of the experimental laboratory work has been conducted in the West, numerous coordinated tests have been run on the Susquehanna. An intensive study of the river from Conowingo Dam in Maryland to the New York State line is being conducted by Fish Commission personnel under the direction of regional fishery manager, Robert J. Bielo.

The research into the water conditions, fish life and other biological factors of the watershed is being expedited as an integral part of the overall survey. Bielo is concentrating on the task of gathering important data to be used in planning the re-establishment of migratory fishes in the Susquehanna watershed. A very complete and continuing investigation is being made regarding the quality of water within the watershed. This investigation includes periodic water quality tests. They are made regularly at established points along the river between the Maryland and New York boundaries. All such information will be carefully analyzed and coordinated in the planning of future fish management in the watershed.

OTHER research projects being conducted by Bielo include electro-fishing tests throughout the entire length of the river, as well as a shad egg hatching experiment. The electro-fishing investigations will be used to show the distribution of the various fish species in the river.

The shad egg hatching project, which was requested by Bell and Holmes, is expected to expedite the development of a strain of American shad which will instinctively attempt to return to spawning grounds located in the upper reaches of the Susquehanna.

"The initial shad egg project can be termed successful, at least so far as the hatching of the eggs is concerned," said Bielo.

"The fertilized shad eggs were obtained from Chesapeake Bay commercial fishermen. They were transported to the Commission's laboratory at Holtwood and to hatching boxes located in the Columbia and Harrisburg areas. Final results of the initial hatching experiment revealed that 80 to 97 per cent of the eggs were hatched in the various locations. Top results were obtained in one of the hatching jars at Holtwood and the 80 per cent hatch was accomplished on the east side of the river at Harrisburg."

The results of this experiment indicate that the problem of artificially propagating shad to the fry stage is a relatively simple matter. This is particularly true if a suitable supply of fertilized shad eggs is available within a twelve-hour drive. It further shows shad eggs will develop and hatch under varying water quality and light conditions, as may be found in certain portions of the Susquehanna River.

OTHER experiments being conducted on the Susquehanna River in connection with the fishway project include the release of elvers in areas above the power dams; also numerous tests have been run at the U. S. Army Corps of Engineers experimental laboratory at York.

A report of the status of the survey was given to the Fish Commission at its July meeting by Bell and Holmes who were in the East on other business.

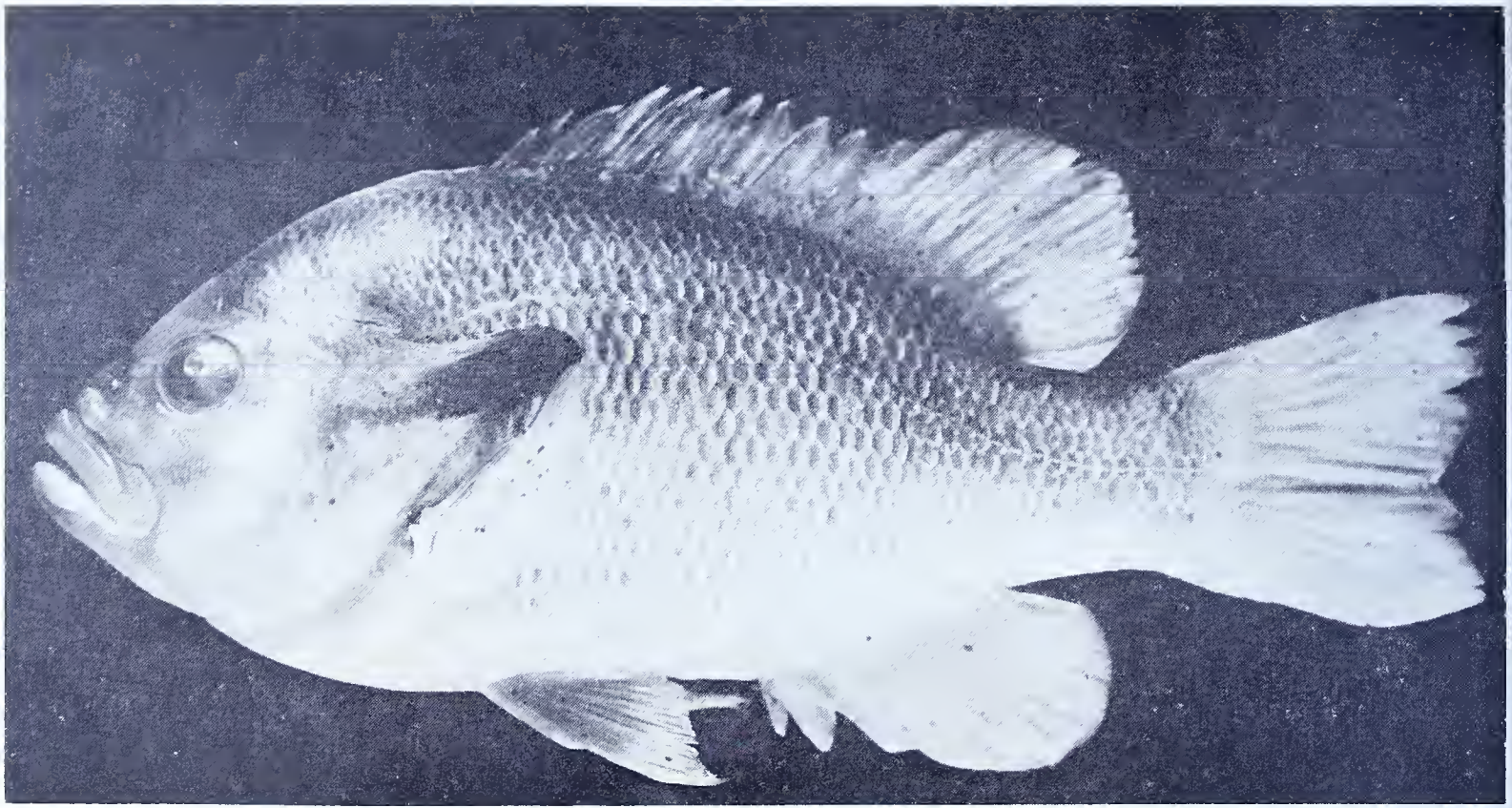
"Through the cooperation of fish and game agencies of Washington, Oregon and Idaho; the U. S. Fish and Wildlife Service and the Corps of Engineers, we have been able to conduct numerous experiments in an expeditious manner," said Bell.

"These experiments have been made at very little cost to Pennsylvania. Equally important is the fact that through the use of the Bonneville Dam facilities, we were able to run many tests which could not have been made on the Susquehanna dams without the construction of expensive equipment."

Biologist Holmes was very enthusiastic concerning the experimental work with shad egg hatching in the Susquehanna. He said this project would prove extremely important in the overall survey.

"We have good reasons to believe that the hatching of shad and other species in upstream sections of the Susquehanna will result in the development of strains of fishes which will have a strong desire to return to their birthplaces at spawning time," said Holmes.

Both Bell and Holmes advised the Commission that in the near future they will have analyzed data gathered so far to the extent that they will be able to recommend the most suitable types of fish passage facilities to be used on the Susquehanna dams. Estimated costs of construction and other important information also will be developed by the team.



THE REDBREAST sunfish is a sporting pan fish found in many of our eastern lakes and rivers. It can be identified by the long, narrow gill flap.

The Age and Growth of the

REDBREAST SUNFISH

in Pennsylvania

PART X

By

JACK MILLER and KEEN BUSS

Fishery Biologists

Benner Spring Fish Research Station

Pennsylvania Fish Commission

▲Most fishermen probably would swear they had never heard of the redbreast sunfish and most certainly had never caught one of these fish. However, if they have ever fished the larger tributaries or the main portions of the Susquehanna, Juniata or Delaware Rivers with small baits, they probably have caught many of these beautiful sunfishes. If they have "bugged" for bass after

dark on some of the northeastern Pennsylvania lakes and caught a sunfish, it was probably the redbreast. The problem is that most fishermen do not distinguish this fish from the pumpkinseed or bluegill. These sporting pan fish differ from the other sunfishes by the shape of the gill flap which is long, solid black and more narrow than the eye (see illustration).

The redbreast is often called yellowbelly or longear sunfish by many fishermen. The true longear sunfish is a distinct species which is found in the Allegheny River System and tributaries to Lake Erie. It rarely exceeds four inches in length. The redbreast or yellowbelly, known to scientists as *Lepomis auritus*, is found east of the Alleghenies from Maine to Florida and west along the coast of Texas.

The growth of the redbreast is comparable, if not greater, than the pumpkinseed and bluegill sunfish. Experiments are now underway at the Pennsylvania Fish Commission's Benner Spring Fish Research Station to study the use of this species in lakes rather than bluegills.

Table I shows the length-weight relationship of redbreast sunfish. Note that when the fish reach 7 inches they weigh about ¼ of a pound and that the weight increases rapidly thereafter.



TABLE I
Length-Weight Relationship of 116 Redbreast Sunfish from Pennsylvania Waters

<i>Length in Inches</i>	<i>Average Weight in Ounces</i>
3.0-3.9	1.0
4.0-4.9	1.6
5.0-5.9	2.2
6.0-6.9	3.3
7.0-7.9	4.0
8.0-8.9	7.1*

* Based on one fish 8.4 inches long.

Redbreast sunfish occasionally grow to ten inches or larger. A private lake in Pike County has a comparatively large population of this species which exceed ten inches in length. Maximum growth in the large rivers rarely exceeds ten inches (Table II) but even at the smaller sizes they provide excellent sport fishing.

If you plan to fish the eastern rivers this summer, give the redbreast a try with flies and small bugs. You may be surprised at the sport that this brightly colored pan fish can furnish.



TABLE II
Average Calculated Total Lengths of the Redbreast Sunfish at Each Annulus in Pennsylvania Waters

<i>Water</i>	<i>Number</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
*Delaware River	127	1.5	3.2	4.9	6.6		
**Susquehanna River	55	1.9	3.5	5.2	6.1		
Five Northeastern Lakes	27	1.2	2.4	3.8	5.1	6.0	6.2

*Data from Tri-State Survey of Delaware River.
**Data from Susquehanna River Survey by Robert Bielo and David Samuels.

Pennsylvania's New MUSKELLUNGE Program

By KEEN BUSS

**Fishery Biologist
Benner Spring Fish Research Station
Pennsylvania Fish Commission**

PART I

A muskellunge program is not new in Pennsylvania. At least the propagation and stocking of fry dates to the nineteenth century. In 1894, fifteen large muskellunge were stocked and in 1896 and 1897, 91,000 fry were planted from the Western Hatchery (Corry Hatchery). In four different years from 1905 to 1917 muskellunge fry hatched from eggs received from New York State were planted in lakes in the western counties which already had an indigenous muskellunge population.

One of the new features of the Fish Commission's program, started in 1953, is the introduction of muskellunge into lakes newly built by the Pennsylvania Fish Commission, Department of Forests and Waters, water supply reservoirs and existing waters not heretofore populated by this species. In other words, an attempt is being made to extend the range of the muskellunge. In the "old days" the fry were planted in the natural range of the muskellunge which consisted of the upper Allegheny River Basin, the Lake Erie drainage and Lake Erie. In fact, these plantings may some day confuse fishery taxonomists (biologists who classify fishes according to their natural relationships). These taxonomists recognize at least three subspecies of muskellunge, one of which is the Ohio musky from Lake Chautauqua, and another is the Great Lakes muskellunge found in Lake Erie. Since the Pennsylvania muskellunge fry propagated in the Western Hatchery originating from eggs from the Lake Chautauqua muskellunge were planted in Lake Erie and Presque Isle Bay in 1912 and 1913, taxonomists will probably find the differentiation of these subspecies more and more difficult.

To get back to our story, what else is new in the muskellunge program? In the last two years, research has been intensified to improve hatchery techniques, increase hatchery production and attempt to find the reasons for heavy losses of eggs or fry which occur in some years. These mortalities are not something recent. Even though many fry were planted in some years before World War I, in three of the seven years that over a half million eggs were received from New York, no fry were planted. They too had their problems but no research followed to alleviate this difficulty. It is planned to continue the present research to solve the existing problems of muskellunge production.

An added twist in the new program is that the new introductions of muskellunge are closely followed. Instead of planting all fry, many muskellunge are reared to six inches or more. These are marked by clipping a fin for future identification. Every reported catch from new introductions is traced so that the value of these introductions can be assessed. Biologist Jack Miller, in 1961, took five muskellunge from Black Moshannon Dam, Centre County, during the spring trap netting and one of these stretched to 37.5 inches and weighed 17.7 pounds. Black Moshannon was first stocked in 1956, the same year that the Bald Eagle Creek in Centre and Clinton Counties was stocked with muskellunge. In 1960, a musky was taken from this stream which was 37.0 inches and weighed 12.5 pounds.

Warden William McIlroy reported eleven authenticated catches of muskellunge from Gordon Lake in Bradford County in 1960. Six of these were legal (over 30 inches) and the largest was 34 inches, probably from the first stocking in 1958. This same year Raystown



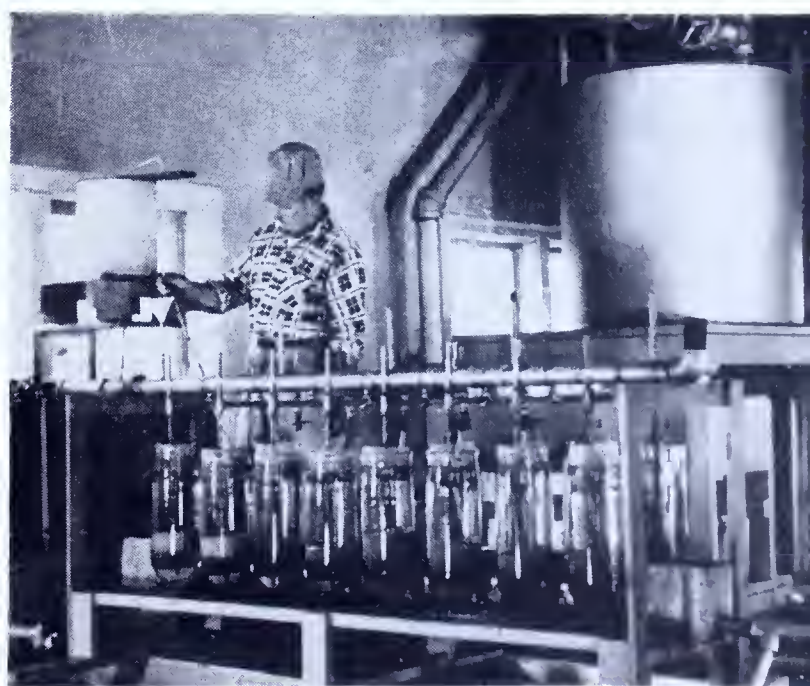
SUPPLY OF MUSKELLUNGE EGGS is obtained by catching the adult muskellunge in nets early in the spring.

Dam on Raystown Branch of the Juniata River was planted with muskies. Warden Supervisor Harold Corbin reported the largest recorded muskellunge taken from this dam in 1960 was 34 inches.

Pymatuning Reservoir was first stocked with muskellunge in 1953. In 1960 Hatchery Superintendent Jerry Zettle at the Linesville Hatchery took 59 spawners averaging 39.2 inches, 18.1 pounds. Those caught during the spring of 1961 averaged between 22 to 25 pounds.

Ten muskellunge taken from Canadohta Lake during the spring trap netting in 1960 were fin-clipped fish stocked in 1956. Fin-clipped fish were also taken from Conneaut Lake and Edinboro Lake. One-third of the muskellunge taken from Edinboro Lake by anglers last year (1960) were fin-clipped fish. Fishery Manager Robert Bielo of the southeast region while stocking small sections of the Susquehanna River in the spring of 1961 below the York Haven Dam took three muskellunge and saw one caught—all in one morning. The largest was 32 inches. One taken in 1959 in this same area was 19 months old and measured 26 inches. This is rapid growth even for a muskellunge.

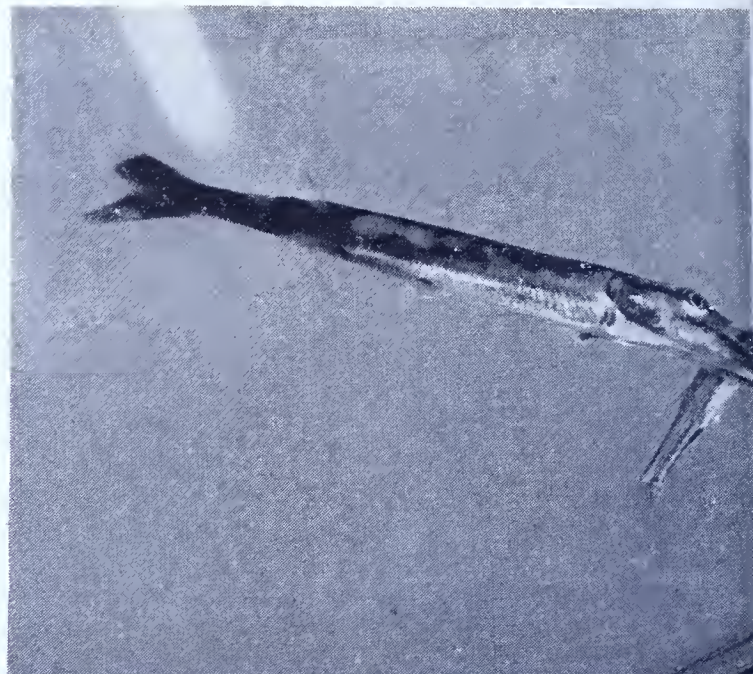
The next step in the program is to determine whether muskellunge will reproduce and grow in their new range. This is a difficult problem since, under natural conditions, only one out of every thousand fry survives to the fingerling stage where they can be seen and counted. Then, as in other stable communities of life, only two will live to replace their progenitors in the spawning population. This may be from 20,000 to 225,000 eggs originally produced by one female. All of this adds up to one huge problem for the biologist.



EGGS ARE INCUBATED in jars in the Fish Commission's hatcheries in the western portion of the Commonwealth.



YOUNG FRY are small and delicate. In the wild, predation accounts for most of them before they are two inches long.



FINGERLINGS spend most of their time eating and growing.

One of the reasons that the fry were planted in only the western lakes at the turn of the century is that the "powers that be" at that time felt that the muskellunge would eat all the other fish when introduced into a new lake. Why they felt they would eat all the fish in a new introduction and not in the lakes in which they already existed, is something to contemplate upon. Be this as it may, one of the reasons for the new introductions in the modern program is to establish a large predator which will aid in controlling excessive fish populations. This, of course, is for the betterment of both pan fish and game fish.

The other reason for the muskellunge program is to make this fine game fish available to more anglers. Even though a person may not be fishing for muskies, he is apt to hold his breath when he casts into a likely spot, sort of inwardly hoping and expecting a musky strike. So much has been written on individual experiences on catching muskies that it would be repetitious to list them here. However, we can add a few items that biologists have learned about the fish and fishing that may be of some aid to a musky fisherman. One of the first requirements of a muskellunge angler is perseverance. Creel censuses have shown that it takes between 75 hours and 150 hours to catch a muskellunge on good musky waters. This will vary with the fisherman and the season. Late spring and early fall fishing is considered the best because it has been found that muskellunge fast for a few weeks during the summer. Also the failure to catch muskellunge during the summer may be due to the abundance of available food, retirement to deep water and sluggishness induced by warm water. It is *not* due to the shedding of teeth, for these are shed constantly throughout the year.

Contrary to popular opinion, research has shown that muskies are sometimes easily caught. As high as 43 per cent of a known population was taken in one summer. In streams, large muskellunge usually remain throughout the summer in the same pool and once located by the angler, are eventually caught. It has also been shown that repetition is also necessary to catch fish. What do we mean by "repetition?" Aquarium studies have shown that a musky will allow a minnow to swim by it many times before something suddenly "clicks" and the minnow is devoured.

What to use for bait? Ask the experts. This we do know. Under certain conditions they will take anything from worms to popping bugs.

If you want to know where to fish, look at the accompanying map. Then it is sit, fish and hope. The rest is in the hands of fate unless you catch one from a new introduction or a fin-clipped fish, these are due to the hands of the Fish Commission employes.

This, in brief, is the new muskellunge program:

1. To increase and improve muskellunge culture.
2. To extend the range of the muskellunge so that more fishermen have access to these fish.
3. To use the muskellunge as a predator to help balance fish populations.
4. To learn the habits of this pike, so that management techniques may be improved and fishermen may have a better chance of catching one.

This is the program, and from the responses which came to this office, it looks as though the fishermen of the Commonwealth agree with this new project.

(Concluded Next Issue)



MANY MUSKELLUNGE are retained until they are six inches or more. They then are fin-clipped and stocked.



FOLLOW-UP NETTINGS are necessary to aid in the determination of the success of stocking.

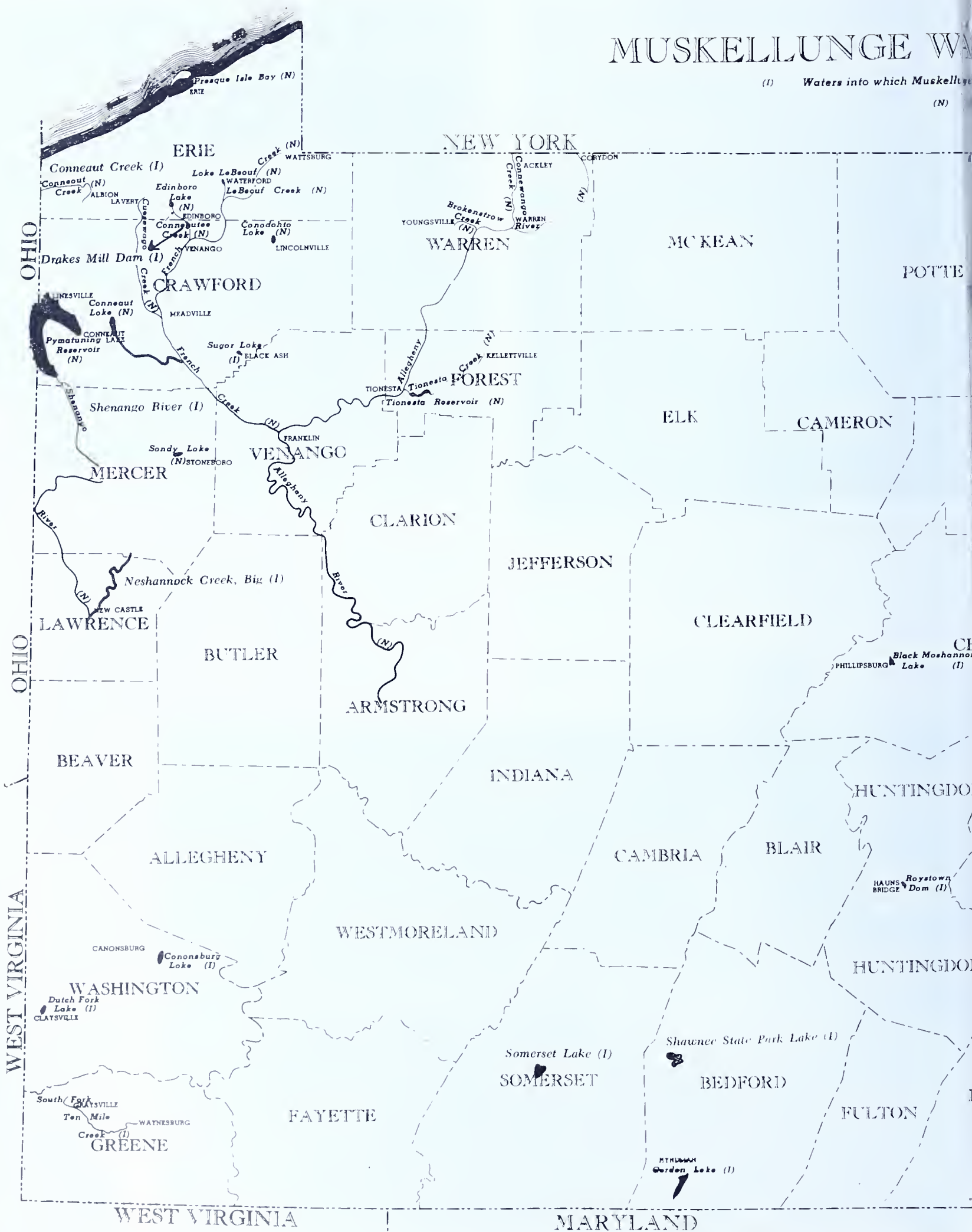
THIS MUSKELLUNGE which was fin-clipped when planted was four years old and measured 30.9 inches.



MUSKELLUNGE WA

(I) Waters into which Muskellunge

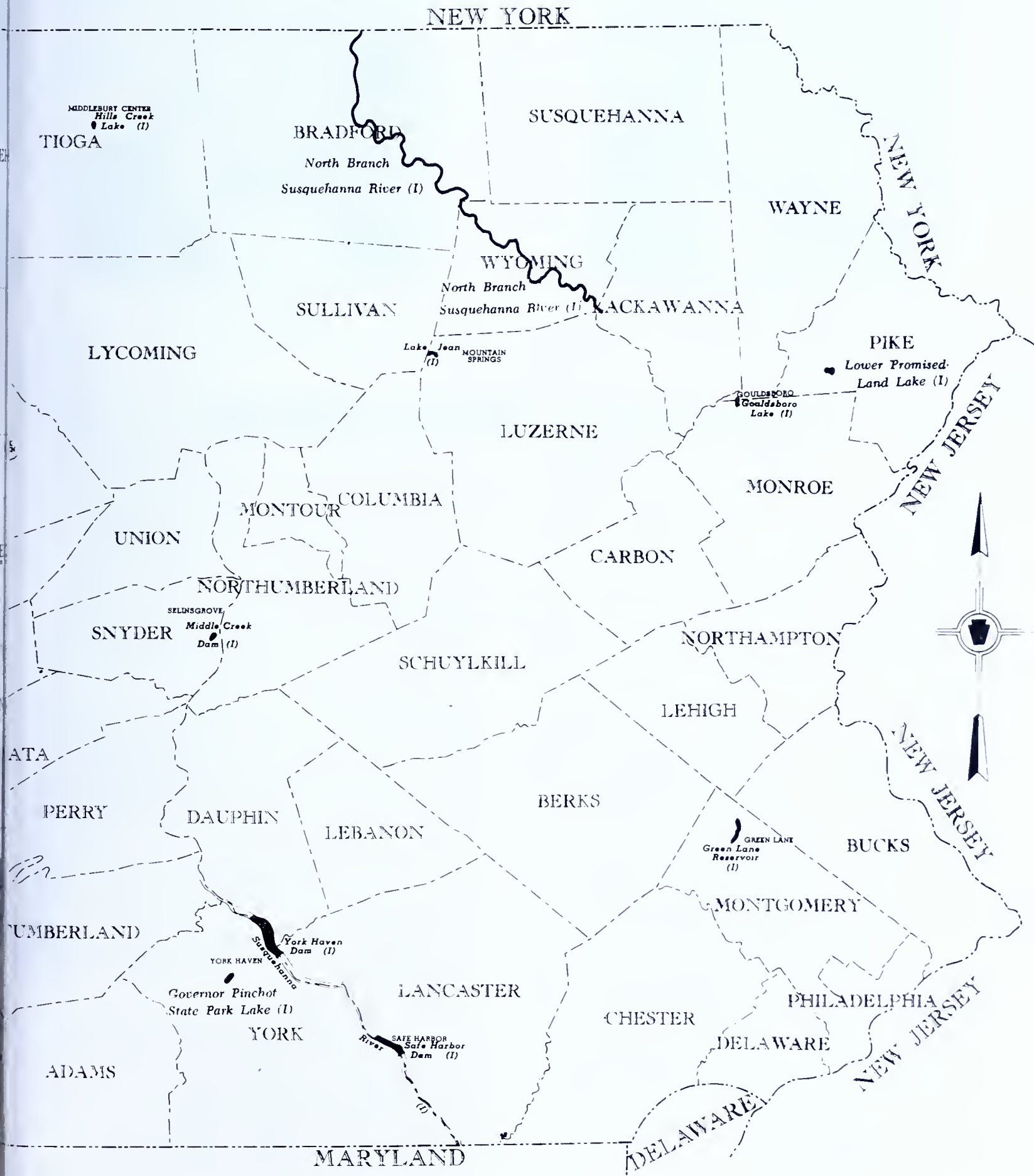
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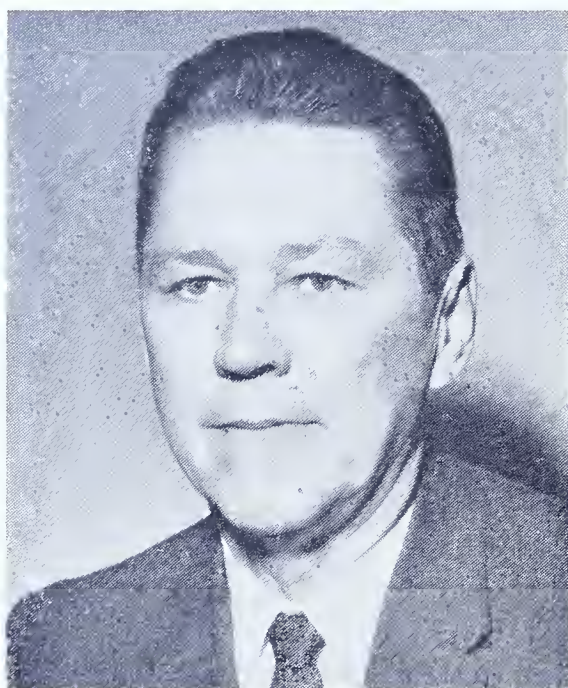


WIN PENNSYLVANIA

ed by Pennsylvania Fish Commission

Waters





**New Commission President
Gerard J. Adams**



**New Commission Vice President
Maynard Bogart**

Commission Officers Elected

Size, Season, Creel Limits on Inland Waters Set for 1962

At the July meeting held in Harrisburg, the Pennsylvania Fish Commission elected Gerard J. Adams of Hawley, Pa., as president and Maynard Bogart of Danville, Pa., at its vice president.

Mr. Adams, who succeeds Wallace C. Dean of Meadville, was first appointed to the Commission on June 1, 1955, by Governor George M. Leader to serve until 1960. He was reappointed by Governor David L. Lawrence to serve until January 1968. An ardent sportsman and civic leader, he is engaged in the theater business in Hawley. He attended Notre Dame and Boston College. He is married to the former Mabel E. Hatton of Blooming Grove and they have three children.

Mr. Bogart was appointed on January 16, 1956, to the Commission to serve until January 1964. He was the first farmer to serve on the Pennsylvania Fish Commission in more than 40 years. He is a popular sportsman, is a member of many sportsmen's organizations and is an active civic leader in his community. As a member of the Commission during the past five years he has been active in all commission projects.

In other action taken by the Commission, Fishing Regulations for 1962 were set as follows:

Principal changes in the regulations included earlier opening dates for the taking of pickerel, walleye, muskellunge and great northern pike. Gar were added to the list of fish which may be taken by archery or spearing.

Size, season and creel limits on the inland waters for 1962 are as follows:

TROUT (brook, brown and rainbow)—5:00 a.m.,

April 14 to midnight, September 3; minimum size—6 inches; daily limit—8, combined species.

LAKE TROUT—5:00 a.m., April 14 to midnight, October 31; no minimum size; daily limit—8.

BASS (largemouth and smallmouth)—January 1 to midnight, March 14 and June 16 to midnight, March 14, 1963; minimum size—9 inches; daily limit—6, combined species.

PICKEREL AND WALLEYE—January 1 to midnight, March 14 and May 12 to midnight, March 14, 1963; minimum size—15 inches; daily limit—6 each species, except two walleye only through the ice.

MUSKELLUNGE—January 1 to midnight, March 14 and May 12 to midnight, March 14, 1963; minimum size—30 inches; daily limit—2.

NORTHERN PIKE—January 1 to midnight, March 14 and May 12 to midnight, March 14, 1963; minimum size—20 inches; daily limit—6.

PAN FISH (Sunfish, bluegills, yellow perch, crappies, rock bass, catfish, suckers)—Open year around; no minimum size; daily limit—50 each, 50 combined species.

BAIT FISH AND FISH BAIT—Open year around; no minimum size; 35 each, 50 combined.

FROGS AND TADPOLES—July 2 to October 31; no minimum size; daily limit—15. It is unlawful to take frogs by the use of an artificial light.

TURTLES—No closed season; no minimum size, daily limit—10.

ARCHERY AND SPEARING—Carp, suckers and

gar may be taken with a long bow and arrow or a spear.

Rules and regulations for the Delaware River between Pennsylvania, New Jersey and New York are as follows:

BASS (largemouth and smallmouth)—Open year around; minimum size—9 inches; daily limit—6, combined species.

TROUT (all species)—April 15 to September 30; minimum size—10 inches; daily limit—5, combined species.

WALLEYE AND PICKEREL—Open year around; no minimum size; daily limit—6, each species.

STRIPED BASS—March 1 to December 31; minimum size—12 inches; no daily limit.

BAIT FISH AND FISH BAIT—Open year around, no minimum size; daily limit—35 each.

Size, season and creel limits for Lake Erie (Presque Isle Bay and peninsular waters) are as follows:

RAINBOW TROUT—April 14 to October 31; minimum size—6 inches; daily limit—8.

BASS (largemouth and smallmouth)—January 1 to midnight, March 14 and June 16 to midnight, March 14, 1963; no minimum size; daily limit—6, combined species.

PIKE (Great Northern)—January 1 to midnight, March 14 to May 12 to midnight, March 14, 1963; minimum size—20 inches; daily limit—6.

MUSKELLUNGE—January 1 to midnight, March 14 and May 12 to midnight, March 14, 1963; minimum size—30 inches; daily limit—2.

Size, season and creel limits on Pymatuning Lake for 1962 are as follows:

MUSKELLUNGE—Open year around; no minimum size; daily limit—2.

BASS (largemouth and smallmouth)—Open year around; no minimum size; daily limit—6; combined species.

WALLEYE—Open year around; no minimum size; daily limit—6, each species.

MINNOWS—Open year around; no minimum size; daily limit—500.

Size, season and creel limits for the Conowingo and Youghiogheny Reservoirs are as follows:

BASS (largemouth and smallmouth)—Open year around; minimum size—9 inches; daily limit—10, combined species.

TROUT (all species)—April 14 to March 14, 1963; minimum size—7 inches; daily limit—5.

PICKEREL AND NORTHERN PIKE—Open year around; minimum size—14 inches; daily limit—5.

WALLEYE—April 1 to November 15; minimum size—14 inches; daily limit—5.

STRIPED BASS (Rock)—Open year around; minimum size—12 inches; no daily limit.

MUSKELLUNGE—June 1 to November 15; minimum size—30 inches; daily limit—2.

BAIT FISH—Open year around; no minimum size; 35 daily limit.

Companionship—At Last!

*When God gave me a little boy
I vowed that I'd ensure,
His every need and every want
And make his life secure.*

*I set a pace that left no time
For idleness or wishing,
No foolish squander of my time
On wasteful things like fishing.*

*I felt quite proud of my results
Until one day he spurned,
My latest gift, a brand new bike
Stood as I placed it, wheels unturned.*

*I searched for him until I found
Him sitting by the brook,
Passing time with an ill-dressed man
And baiting up a hook.*

*I listened quietly as he spoke
"Hey Dad, you have a bite.
Gee, this is ever so much fun
To have you here tonight."*

*My puzzled heart turned cold inside;
Had someone filled my place?
I took another look to find
The stranger had no face.*

*The boy had propped my fishing hat
And coat upon a pole,
To take my place upon the bank
Of the old fishing hole.*

*I grieved to think that I had been
Replaced by apparition.
Then and there I learned the truth
'Bout boys and dads and fishing.*

*I took my place beside the boy.
My heart welled up with shame.
"I'm sorry that I'm late," I said,
"I've no one else to blame."*

*I donned the shapeless hat and coat
And felt relieved to find,
They fit a man who'd just grown up
In stature and in mind.*

*"I hope you haven't caught them all."
He looked at me with glee.
"No Dad, I've always put them back,
'Til you could fish with me."*

—Day Yeager



AERIAL VIEW of 172-acre Belmont Lake, Wayne County.

Belmont Lake, Wayne Co., Opens 172 Acres of Warm- Water Fishing to Penna. Anglers

Pennsylvania anglers wet lines for the first time at newly opened Belmont Lake, Wayne County, on June 17. The lake will offer 172 acres of fine warm-water fishing to the public. Costing approximately \$135,000 of Fish Commission-Dingel-Johnson funds, the project also provides a black top road leading to an access area. The area accommodates 50 cars, has rest room facilities, a full-size black top boat launching ramp to the water.

The Fish Commission owned and operated lake was purchased from Wayne Storage Company in 1912 along with the Hankins, Millers, White Oak and Long Ponds. In 1941 the Pennsylvania Fish Commission rebuilt the bulkhead on the lake (formerly 100 acres) which was then used as a warm-water propagation area.

Special fishing regulations in effect: pickerel—minimum size 18 inches, 3 daily creel limit; walleye—15-inch minimum size, daily creel limit—3; smallmouth and largemouth bass—minimum size 12 inches, daily creel limit—3 of combined species; pan fish, same as state regulations—no minimum size, 25 of each, 50 of combined species.

Boats may be moored at the lake but permits will be required. No permit required for launching and removing boat the same day. The lake may be reached on Route 670 about 2 miles north of Pleasant Mount, Pa. Signs have been erected to guide anglers and the public to the access area.

BELMONT LAKE DAM that impounds warm-water fishing area.



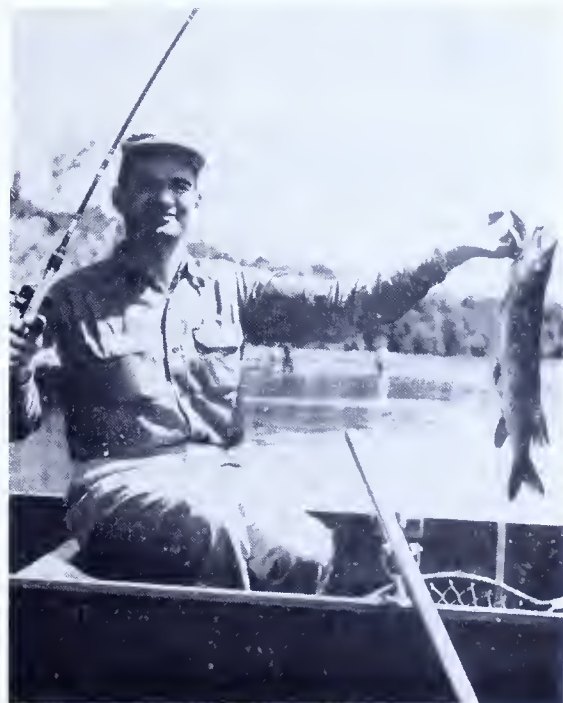


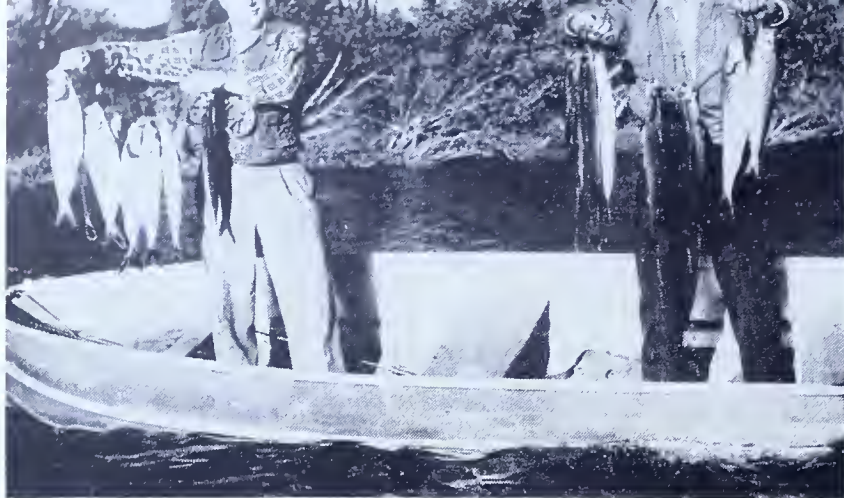
THE ROAD TO boat launching area.



BOAT LAUNCHING ramp is of black top down to water's edge.

And . . . Opening Day Results at Belmont Lake!





ONCE A SHAD FISHERMAN . . . always a shad fisherman, or so it seems. Dick Shubert and Vincent Graziano can prove it.

Shad Egg Hatch High in Commission Tests

(See also page 2 herein)

An intensive study of the Susquehanna River from Conowingo Dam in Maryland to the New York State line is being conducted by the Pennsylvania Fish Commission. The research into the water conditions, fishlife and other biological factors of the watershed is being expedited as an integral part of the Susquehanna survey. This survey, authorized nearly a year ago by the Legislature, is being conducted under the direction of Milo Bell of the State of Washington and Harlan Holmes of Oregon.

Most of this investigative work is being done by Commission personnel under the direction of Robert Bielo, Southeast regional fishery manager. Bielo is concentrating on the task of gathering important data to be used in planning the re-establishment of migratory fishes in the Susquehanna watershed. This program, of course, will require the creation of workable fishways at Conowingo, Holtwood and Safe Harbor Dams.

Research projects being conducted by Bielo include electro-fishing tests throughout the entire length of the river, as well as a shad egg hatching experiment. The electro-fishing investigations will be used to show distribution of the various fish species in the river.

A very complete and continuing investigation also is being made regarding the quality of water within the watershed. This investigation includes periodic water quality tests made regularly at established points along the river between the Maryland and New York boundaries. All such information will be carefully analyzed and coordinated in the planning of future fish management in the watershed.

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The fertilized shad eggs were obtained from Chesapeake Bay commercial fishermen. They were then transported to the Commission's laboratory at Holtwood and to hatching boxes located in the Columbia and Harrisburg areas. Final results of the initial hatching experiment revealed that from 80 per cent to 97 per cent of the eggs were hatched in the various locations. Top results were obtained in one of the hatching jars at Holtwood and the 80 per cent hatch was accomplished on the East side of the river at Harrisburg.

The results of this experiment indicate that the problem of artificially propagating shad to the fry stage is a relatively simple matter if a suitable supply of fertilized shad eggs is available within a twelve-hour drive. It further shows shad eggs will develop and hatch under varying water quality and light conditions, as may be found in certain portions of the Susquehanna River.

Other experiments being conducted along the Susquehanna River in connection with the fishway project include the release of elvers in areas above the power dams; also numerous tests have been run at the U. S. Army Corps of Engineers experimental laboratory in York.

The information obtained from the Susquehanna River experiments will be coordinated with the information obtained from other experimental work being conducted by Bell and Holmes. The survey team is supervising a number of tests in the experimental fishway facilities at Bonneville Dam and at other existing fishways in the far West. Most of these experiments being done in cooperation with the State and Federal agencies involved are being conducted at little or no cost to Pennsylvania.

Much of the experimentation is being done with shad since Bell and Holmes are convinced that in general, fishways which will provide passage for shad will readily do so for most other migratory species.

Standing Stone Creek Club Helps Landowners

The Standing Stone Creek Hunting and Fishing Association has established better public relations with landowners in their area by painting and lettering 24 refuse drums and placing them at various points along Stone Creek and the East Branch. Six new stiles were installed and others repaired over fences for use of anglers. Appropriate signs were posted in lanes, driveways and at buildings where parking is prohibited.

Why are the hands on dummy clocks in front of jewelry stores set at 8:17 o'clock? Many folks think it's because President Lincoln died at that hour and moment. Not so . . . real reason is the angle of the hands gives maximum advertising space.

One of those smart guys who think they know just about everything stopped in front of a taxidermist store. In the window was an owl that attracted many people. Disdainfully viewing the bird he loudly declared . . . "If I couldn't stuff a bird better than that one I'd give up!" Before he could enter into another tirade, the owl turned his head and winked at him.



KIBITZERS (including Hon. Maynard Bogart, Vice President, Pennsylvania Fish Commission) and contestants at Danville Children's Fishing Rodeo.

—Johnny Nicklas, Pennsylvania Fish Commission photos



As Kids Rode Herd At Danville Fishing Rodeo

With 1,450 children registered for the event, the first annual fishing derby sponsored by the Danville Retail Merchants Association, proved to be a great success.

The event was staged on May 6, 1961, along Mahoning Creek, within the borough limits. The only sad conclusion was that the heavy downpour of rain forced the judges to call off the derby an hour earlier, to prevent any unforeseen omen among the children.

There were only three minor mishaps listed, and these were caused by fish hooks.

The contestants, ranging in age from six to 14, fished in groups, with adults serving as supervisors. No wading was permitted, and the children were permitted to use only "worms or salmon eggs." The anglers were permitted to retain three trout.

The champ among the boys was Robert Oshetski, 304 Avenue E, Riverside, whose catch was a brook trout measuring 14¾ inches. Karen Farnsworth's specimen, a 14½-inch rainbow, netted her the title champ among the girls. She's from Elysburg, R. D. 3.

Other awards that the children looked forward to, were the fin-clipped trout, which earned them a "silver dollar." The Moose Association provided five fishing outfits for the next list of prizes for the largest fish.

Approximately 1,000 fish, ranging from 7" to 21", consisting of brook, brown, rainbow and splake, were purchased by the Danville Retail Association for the event. Seventeen adults provided the assistance. With the Red Cross was Dr. Myron Sebick of the Geisinger Hospital staff assigned for the first-aid service. An area of 200 yards was wired off, and roped in sections for the age category.

W. A. McCloughan, president of the retail merchants, awarded the first place trophies to the winners. Chairman of the event was Robert Lee.

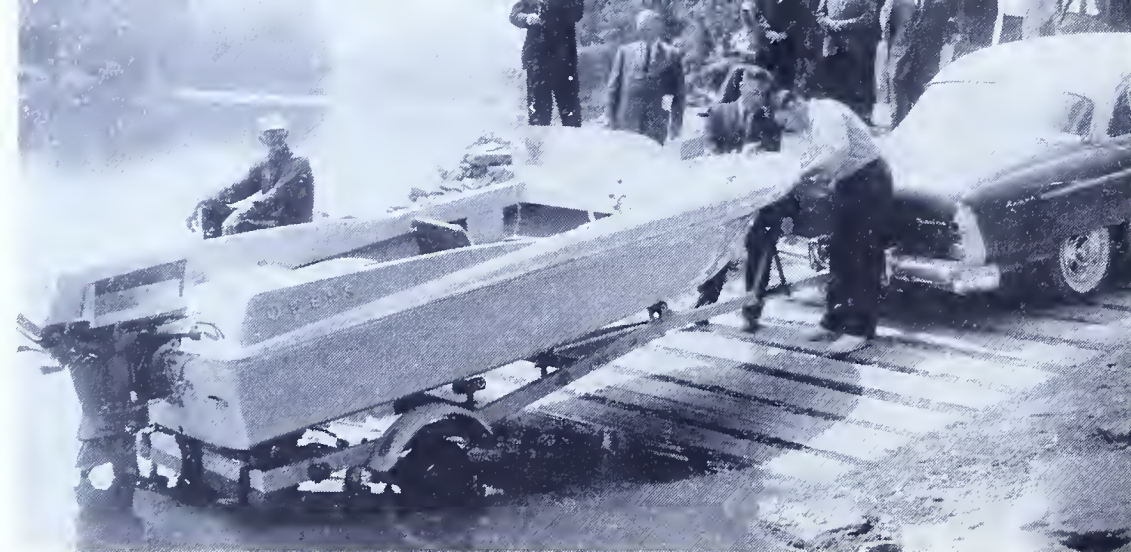
Six tons (12,000 pounds if you prefer) of water per day is your share of U. S. water consumption this year!



Fish Return to Lackawanna After 100 Years

The Lackawanna staged a comeback after being counted out more than a century ago by acid-laden waters from mining operations in the area. Anglers at first caught carp in the Susquehanna tributary, then catfish and pan fish. Some of the carp taken were in the "tackle-buster" class. At Old Forge, where the first catches were reported, most fishermen crossed their fingers and grinned their approval.

"Bring Home the Bacon" . . . this expression originated in the 13th Century from the custom of giving a pound of bacon to any married person who could kneel before the church door and swear he had not had a family quarrel in the last 12 months.



—Lancaster Intelligencer photo by Bob Miller

FIRST BOAT LAUNCHED at Otter Creek by Hon. John Grenoble, member, Pennsylvania Fish Commission. The new ramp installed by the Pennsylvania Power and Light Company will provide launching area for many southern tier county fishermen and boatmen.

Otter Creek Boat Launching Ramp Dedicated

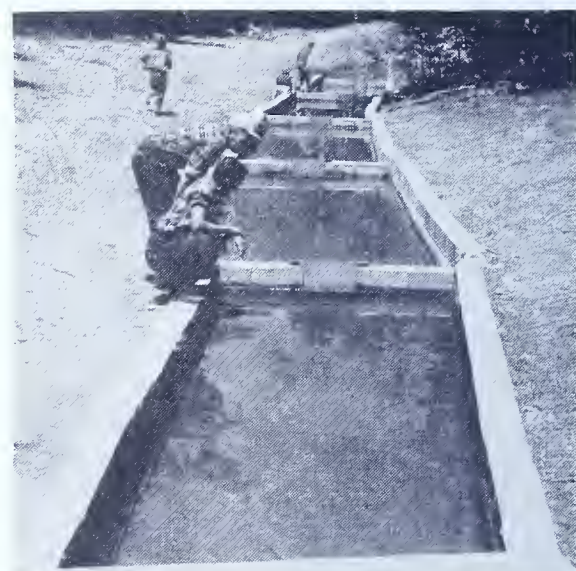
At a special ceremony on Wednesday, June 28, 1961, officials of Pennsylvania Power and Light Company dedicated a public boat launching ramp and car parking area at the junction of Otter Creek and the Susquehanna River.

The dedication was attended by some fifty persons, including members of the Fish Commission, legislators from Lancaster and York Counties and representatives of local sportsmen's associations. A luncheon at the Tucquan Club House followed the launching of the first boat.

P. W. Siekman, PP&L's vice president—general services, told guests that the facility is being made available to local sportsmen as a public service by PP&L. He said that, in development of its facilities, PP&L gives all possible consideration to recreational opportunities for the public.

"We feel that we have a responsibility for all-around good citizenship in the area we serve," he said, "and this is one of several ways in which we try to meet that responsibility."

The Otter Creek boat launching ramp is the second that the company has provided for the convenience of the public, according to Mr. Siekman. The other ramp site was dedicated last month at the Martins Creek power plant on the Delaware River. A boat launching ramp is also available at Lake Clarke, above Lake Aldred on the Susquehanna, and is provided by Safe Harbor Water Power Corporation, of which PP&L is part owner.



NEW PONDS of Hillside Rod and Gun Club at Blossburg, Pa., handled 10,000 fingerling brook trout from Pennsylvania Fish Commission. The project begun last spring under supervision of Howard Fox includes ponds 200 feet long, 7 feet wide and 25 feet to the section as shown. Ponds are spring-fed with an output of 80 gallons per minute.

FINGERLINGS get an assist into new home from (l-r) Leland Cloos, District Fish Warden; Hon. Maynard Bogart, Member, Pennsylvania Fish Commission; Club President, Hillside Rod and Gun Club, Charles Bogaczyak; Jerry Reid, John Jackson and Jack Eckman.





—Simpson photo

DENNIS CREEK FISHING RODEO attracted 1,200 young anglers recently co-sponsored by the Chambersburg Rod and Gun Club and radio station WCBG.

Fish Rodeo Attracts Over 400 Children

Over 1,200 adults and children attended the fishing rodeo recently at Dennis Creek.

The rodeo, co-sponsored by the Chambersburg Rod and Gun Club and radio station WCBG, was rated a success. Over 400 children registered and participated.

Officially opening the rodeo, W. W. Britton, chief law enforcement officer of Pennsylvania Fish Commission, read the rules and regulations.

Also attending were Harold Corbin, regional supervisor from Huntingdon, and the local fish warden, Bryce Carnell, Pennsylvania Fish Commission.

Prizes were awarded to the boy and girl for the first fish caught, largest fish caught, smallest fish and the first to catch eight trout. The largest fish was 17½ inches and the smallest, 8½ inches. Over 400 of 600 stocked trout were caught.

Angler Catch Tops at Lake Jean

A heavy turnout of anglers at Lake Jean marked bass opening day in northeast Pennsylvania. The 278-acre lake yielded better than excellent catches of bass, pickerel and other warm-water fish. Anglers were apprehensive of tackle and gear because also on the possible catching list were muskies planted by the Pennsylvania Fish Commission.

Boat launching area was jammed to capacity but somehow everyone found a spot to fish and most were catching fish. It was a good all-around opening day at the lake.

Fish for Fun ... and Cash!

Somewhere in the Susquehanna River there are 28 largemouth bass wearing tags worth a total of \$5,500. All an angler has to do is catch one of these fish, take or mail the tag to WGAL-TV, Lincoln Highway West, Lancaster, Pa., and receive the prize amount registered on the tag. Of the 28 fish stocked, 25 bear tags worth \$100 each and 3 worth \$1,000 each. The TV station would like some details on the catch . . . where? . . . on what bait? . . . etc. Tags turned in by December 31, 1961, will be paid off.

Bass Derby Launched by Tunkhannock Club

With the carp and sucker fishermen paid off for this year, the Tunkhannock Sportsmen's Club turned its attention to the bass fishermen, with the launching of the first Susquehanna Bass Derby.

Offering \$210 in cash prizes, this competition is very similar to the just concluded carp derby.

First prize for the largest smallmouth bass will amount to \$125; 2nd, \$50; 3rd, \$25, and 4th, \$10.

Fish must be taken from the Susquehanna River in the area between the river bridges at Falls and Laceyville, with the derby running from the present time through September 4.

Entry fee is 50 cents, and fishermen must register before going out on the river to angle for prize specimens. Blanks may be secured at the same firms which handled the carp derby applications, but, in the interest of accuracy, all bass must be weighed in at the Moss Service Station, Tunkhannock, to qualify for prizes.

Once more, Tom Monsey and George Solanick are co-chairmen of the bass derby, with Cecil Krewson, Jr., serving as treasurer.

World War III is unique in that it will never be mentioned in history books.

Boating

Group Cruises Popular

There are those boatmen who like to stow the family aboard and take off for a weekend or a full vacation of solitude. There are also those who like to take the family and cruise in company with others.

Organized group cruises are gaining in popularity. Many outboard runabout clubs and outboard cruiser clubs plan several group cruises each season, including from 10 to 30 boats. With the organization of more active cruising clubs around the country, these organized cruises are certain to continue to flourish.

"Once you get your boat, you'll find you have no difficulty making friends on the water," writes Fessenden Blanchard in "Outboard Cruising." This is true whether you join a boat club or are just naturally exposed to other boatmen. And once you've made friends, you'll probably find yourself taking part in some group cruise.

The most common form of group cruising is the informal excursion of two or more boats. These are made up of friends, members of the same boat club, or people who keep their craft at the same anchorage. They simply get together and decide to cruise to the same spot.

This type of cruise is very much akin to the group picnic. Everyone brings supplies for a day or a weekend of cruising; they raft together or stop together for meals

and, if overnight, anchor close together for the night.

Not only is it fun to cruise in company with others, it is also informative and protective. Any boatman can always learn some skills from another. They can swap experiences, and find new cruising waters by this exchange. The caravan nature of the group cruise is ideal in the event any member of the group should have any mechanical or technical difficulty.

Boatmen are a naturally friendly lot. They love the company of other boaters. For that reason the group cruise, be it formally organized or of the spur-of-the-moment variety, will continue to grow in popularity.

Midseason Check of Boating Rig

Midway through the boating season it normally becomes necessary for a systematic checkup of your boating rig in order to insure maximum performance. This includes more than a cursory examination of the boat's hull.

Engineers at Evinrude Motors suggest the spark plugs be removed and inspected, cleaned if necessary and replaced if they appear defective. This bit of advice is good whether or not you do much running. The battery may need a charge if you operate a motor without a generator. It's embarrassing, and sometimes dan-

NATURAL PART OF GROUP CRUISING is rafting together of the boats of those making the cruise. On a river or lake cruise, it is natural to tie the boats together and enjoy a company picnic lunch, or stop for refreshments. One or more of the boats will be anchored to prevent drifting, and others tie up to them. They can check charts, plan their course or just plain chat.



gerous, to suddenly discover a dead battery. Battery terminals should be cleaned and the electrical connections should be checked for frayed or worn insulation.

You should inspect the lubricant in the lower gear case to see that it is free of water or air bubbles, and change if necessary. Check the propeller to see that it is not nicked or bent, and have it re-pitched if it appears to need it.

If you have noticed a drop-off in rpm of the engine, or if any persistent trouble develops, it's best to take it to your marine dealer for an inspection.

The mooring hardware should be inspected for loose fasteners and possible corrosion. Look over the steering cables and pulleys to see that they are firmly seated. Replace any frayed cable.

You should also check the accessories. Be sure your anchor line is firm. You may have lost some of your mooring lines, or they may become frayed and lose strength. Give life jackets and buoyant cushions a complete check to see that they have not become damaged or mildewed. Replenish the supplies in your first aid kit. See that the fire extinguisher is properly charged and easily available. Inspect your tool kit to see that you have lost no tools, and get some new batteries for the flashlight. Better to be safe than sorry!

Take the Kids Boating

Kids normally get more than their share of enjoyment out of pleasure boating—until they are forced into a routine marked by prolonged periods of inactivity. This is as repulsive to them as washing behind the ears.

As youngsters are an inseparable part of the spirit of togetherness that has made pleasure boating the great family activity that it is, it naturally follows that some thought must be given to their peace of mind aboard the boat. This will assure peace of mind for the adults aboard.

The same sort of activity can be arranged for the youngsters when boating as when planning any other form of recreation. The pre-school age youngster will generally be happy to play with some of his favorite toys. Those who normally take naps will likely be more than willing to do so aboard if a place is provided for them to relax. The combination of the open air and action of the boat will lull them into sleepiness.

The grade schoolers will require more preparation. Activities should be planned which follow their normal interests and hobbies. If they like to swim, plan your cruise so you can stop near a beach or let them swim from the boat. They will probably be water ski enthusiasts, so plan to let them take a spin behind the boat. They will likely want to do some fishing, so come prepared. And let them do the kind of fishing kids like. They like it where they get plenty of action, even if the fish are small. They won't be happy with long periods of trolling or fishing only for the big ones which bite only infrequently.

If they like to collect rocks or shells or driftwood, let them wear off energy in this fashion once or twice



THE BOY WHO GOES FISHING WITH HIS DAD AND A BOAT feels an adventurous kinship with Huckleberry Finn. Despite his age, he'll mature for a while in man-to-man association with his father. These are the incidents he will remember long after other activities of his childhood become faded memories.

a day. If they are artistic, they'll spot scenes they want to draw or paint while en route. Some of the world's fine paintings include water scenes, so let them bring their artist's supplies along. If they are interested in nature—and what child isn't—give them an opportunity to observe, and take an interest in it yourself. A pair of binoculars, plus a bird guide book will keep many youngsters occupied for hours.

The best advice on the teen-agers is to let them do something else unless you plan a cruise filled with a great deal of more or less vigorous activity. They'll want to water ski, swim, play beach games, navigate and to take a turn at the helm.

In all cases, let the kids in on the planning. Anticipation is very important to the small fry. They'll get as big a kick from the planning as from the doing. Also, let them feel as though they are an integral part of the crew. They should be allowed to operate the boat (under proper supervision), to have a voice in where you will go and what you will do. And when it comes to duties, theirs should not be confined to cleaning.

Leave your itinerary very loose when cruising with kids. Their whims don't respond to regimentation. Keep an interest in what lies ahead. Kids don't care where they've been—they want to know where they are going.

It generally won't impress the kids to plan meal stops at fancy clubs. They will prefer hamburgers and potato chips to vichyssoise and beef stroganoff.

One final suggestion . . . carry plenty of water in insulated containers, and have quick snacks available. The thirst and appetite of a youngster aboard a boat knows no limit.

Regular Fish Wardens of the Pennsylvania Fish Commission

Chief Fish Warden—W. W. Britton, Harrisburg

Phone Hbg. CEdar 8-5151, Ext. 2077

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Pennsylvania

Angler

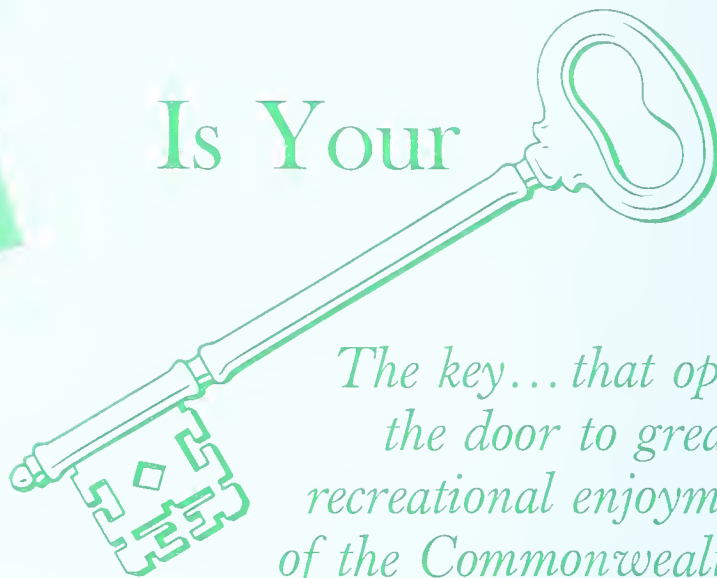
September 1961





THE PENNSYLVANIA ANGLER

Is Your



*The key... that opens
the door to greater
recreational enjoyment
of the Commonwealth's
water resources.*

The key . . . that each month will give you information on what your Fish Commission is doing to improve your favorite outdoor recreation—plus stories, articles and reports on boating, archery, ice fishing, tackle tips, angling techniques and “how-to” items. Also featured will be sections of special interest to women and children. Special efforts will be made to publicize the fish management and water conservation activities of sportsmen’s groups.

Just as the price of keys and other equipment has increased in recent years, so have the costs of production of the magazine. These costs have nearly doubled in nine years—and it has been that long since there has been an increase in the ANGLER subscription rates.

After careful deliberation, and in keeping with its determination to see that the ANGLER provides a broader coverage of the entire field of water sports activities, the Fish Commission found it necessary to increase yearly subscription rates from \$1 to \$2, effective October 1, 1961. This action has been taken in an effort to put the magazine on a sound financial basis. At the same time, as an inducement for long-term subscriptions, the Commission also authorized the special rate of three years for \$5.

Renewals and new subscriptions for one year only will continue to be accepted through September 30, 1961.

It is expected that the size of the magazine will be increased as additional revenue permits. Additional services and improvements such as color reproductions also are planned.

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Pennsylvania Angler

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SEPTEMBER, 1961

VOL. 30, NO. 9



GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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By LaMar Mumber

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NOTICE: Subscriptions received and processed after the 10th of each month will begin with the second month following.

General Assembly Approves G. S. A. Financing of Fish Commission Projects

By **RUSSELL S. ORR**, Chief
Conservation Education Division



The construction and improvement of fishing, boating and recreational areas in the Commonwealth will be advanced by many years when \$2,913,063 of General State Authority funds recently approved by the General Assembly becomes available to the Pennsylvania Fish Commission.

The proposed program of Fish Commission projects to be financed by these funds already has met with the enthusiastic support of Governor David L. Lawrence and the Department of Forests and Waters.

The Fish Commission will utilize the General State Authority funds to acquire sites and to construct needed fishing and boating facilities on a long term financing and leasing arrangement. At the end of the lease periods, titles to the properties will be transferred to the Commission. This will add more units to the already substantial list of fishing and boating access sites owned by the state agency.

In the past the Commission has had to build facilities on a "cash on the barrelhead" basis. Because of this, many valuable properties have slipped away from public ownership.

Without limited resources we just cannot save enough spot cash to build the lakes and other facilities people in Pennsylvania need and deserve. Neither can anyone else in building his own home. We are no different.

Now we are going into a long range financing program. Additional license sales from people who will benefit by the new lakes and launching ramps will more than pay the amortization costs. The Federal Aid Dingell-Johnson program will provide funds for a substantial portion of these annual costs.

This new G. S. A. program provides for fishing lakes in nine sections of the state and boat launching ramp sites on four of the Commonwealth's principal boating

waters—including the Delaware and Ohio Rivers, Lake Erie, and Harvey's Lake in Luzerne County. Since the Fish Commission administers both fishing and boating regulations, the new program was designed to meet the constantly increasing pressure for extended multiple use of the Commonwealth's water recreational facilities.

The properties scheduled for development under the program include the Baltimore and Ohio Reservoirs in Jefferson County, one located near Punxsutawney and the other near Falls Creek. Approximately 200 acres of excellent fishing waters will be made available to the public by acquisition and development of these properties. The total estimated cost of this project is \$271,224

Lily Lake, with a water area of 150 acres, is a natural lake located in southern Luzerne County. The cost will be \$159,473.

Negro Glade Dam, situated in southern Somerset County, will create a lake of more than 300 acres. The site is near Mt. David, the highest point in Pennsylvania. The cost of construction of the dam is to be \$352,000.

The sum of \$503,801 has been set aside for acquisition of land and construction of the dam on Hammer Creek in Lancaster County. The lake, which will be located near Lititz, will contain more than 100 acres.

East Bangor Dam in Northampton County, will be acquired and improved at a cost of \$226,285.

The East Branch of Martins Creek project, which will create a 130-acre lake at a cost of \$327,424, also is located in Northampton County.

The acquisition of land at a cost of \$79,736 is listed for a dam site on Four Mile Run in Westmoreland County.

Also in western Pennsylvania is the proposed acquisition of land and the construction of a dam on Yellow Creek in Indiana County at a cost of \$442,337.

One hundred fifty-eight thousand two hundred forty-four dollars has been set aside for acquisition of land and construction of a dam near Columbus in Warren County.

There are four projects listed for the acquisition and development of public access sites. The Delaware River boating area, expected to be located in Bucks County,

One of the Fish Commission's Newer Boater-Angler Access Areas at Franklin, Pa.



FRANKLIN AREA before construction by the Fish Commission.



AFTER completion of Franklin Access Area.

is to cost \$121,125. The acquisition of land, construction of roads, parking lot, boat launching ramps, docking facilities and sanitary facilities are included in the improvements for this project.

A similar project costing \$85,172 is slated for Lake Erie in Erie County.

Access to the Ohio River somewhere in Beaver, Butler or Allegheny County is planned at a cost of \$148,761.

The final access project listed is slated for Harvey's Lake in Luzerne County. The appropriation will be in the amount of \$37,472.



the **NORTHERN PIKE**

▲ Presque Isle in Lake Erie exists as such because of man's incongruities, nature's vagaries and man's ingenuity. It is incongruous because it is not an isle but rather a peninsula, a sand spit which extends two and a half miles from the shore of Lake Erie. This sand spit which almost, but not quite, surrounds Presque Isle Bay was created by wind action and water currents.

Presque Isle was a dynamic feature of Lake Erie moving, it has been estimated, one mile every 300 years. Man has changed all this. Due to the value of the spit in protecting the bay and harbor and because of its utilization as a recreation area, the peninsula has been stabilized by man-made structures. These structures protect it from the prevailing winds and water currents which would tend to move it to the eastward.

Within the bay created by Presque Isle lie some of the finest and most diversified fishing areas in Pennsylvania. On the north shore of the bay is Misery Bay and the lagoon area. Misery Bay is situated behind the point upon which is located Admiral Perry's monument. The lagoon area is a series of shallow sloughs extending like fingers into the sand spit. It is here in the early spring that many piscatorial residents of the bay come to spawn. Other species spend their entire lives in this productive environment. The west end of Presque Isle Bay proper is another comparatively shallow area utilized by many fish species for habitat and reproduction. These three areas are characteristically different because of the prevailing winds, currents and water temperatures which are dispersed differently because of the contours of Presque Isle.

Presque Isle Bay has many species which are normally found in the lake proper but it also has species that are more or less indigenous only to protected water areas in the lake. One of these species is the northern pike. It is this species that the Pennsylvania Fish Commission became interested in when it decided to expand its warm water fishery program. First, the Fish Commission was interested in obtaining a source of northern pike eggs so that this species could be introduced in many water areas where fish predators were necessary. It may also be added that the pike is a fine game fish

for these areas. Secondly, the Fish Commission was interested in the habits and, it might be added, the "love life" of this species. It is the habits and love life of this fish that this narrative will encompass. For knowledge of these facts is the backbone of future management and preservation.

The spring of 1960 was a particularly long and cold spring. It was not until March 30 that Shyrl Hood, superintendent of the Erie Hatchery, and his men could place the first nets in the lagoon area. On March 31, Superintendent Hood called the Benner Spring Fish Research Station. "The pike are running," he said. This is all that was needed. The biologists and fish culturists from Benner Spring were off to aid Shyrl and his men for the next three weeks.

What did they learn in the next three weeks about the habits of the northern pike? The northern pike started their spawning run into the lagoon area when the water temperature was 37° F., but the best catches were made between 40 and 46° F. The pike did not start to run into the western end of the bay until ten days later when the water temperatures reached 40° F. They ran best when the water temperature was between 40 and 50° F. and some fish were caught when the water temperature reached 55° F. Strangely enough, the fish didn't start to run in any numbers into the west end of the bay until the run had practically ceased in the lagoon. This was probably related to temperature since the lagoon area thaws earlier, and is the first to warm. Whether the same fish did, or would have, run into the lagoon if the water had not been too warm is unknown. There is a possibility that there are two separate populations inhabiting the bay area.

It is generally accepted that there are many stimuli that cause a fish to start a spawning run or cause them to produce eggs and sperm. Water temperature, the length of day, the presence of submerged vegetation, the presence of other spawning pike, and the water level all act to stimulate the adult fish. However, the crew working on the bay was anxious to try to correlate the spawning run with other natural phenomena. There didn't seem to be any correlation between wind direc-

resque Isle Bay, Lake Erie

by

KEEN BUSS and ALFRED LARSEN

Fishery Biologists

Pennsylvania Fish Commission

Photos by Johnny Nicklas

tion, air temperatures, clear or cloudy weather, or wind speed, except in the effect these elements might have on water temperature and water level. There was no correlations evident between the spawning run and the moon phases. The trapping was conducted in only three phases of the moon—first quarter, full and last quarter. No trapping was done during the new moon. Water temperature affected the spawning run, and when temperatures increased the catches increased. A sharp decrease in water temperatures resulted in a lowered catch in the trap nets. There also seemed to be a trend in the catches associated with barometric pressures as better catches were made when the pressure was rising. Higher water levels also seemed to increase the catch.

A total of 191 adults were trapped. Of these, 90 were females and 101 were males. Sex ratios in animals tend to approach a 1:1 ratio, but this is distorted in this sample because many more males mature at one year of age than do females.



TAKING SCALES from northern pike during 1960 study.

ENTRANCE TO LAGOON area where the pike migrate to spawn.



The age composition of the northern pike taken is shown in the following chart:

AGE COMPOSITION OF NORTHERN PIKE
IN PRESQUE ISLE BAY

Year Hatched	Age (1960)	Females		Males		Combined	
		No.	%	No.	%	No.	%
1959	I	3	3	35	35	38	20
1958	II	38	44	46	45	84	45
1957	III	8	9	19	19	27	14
1956	IV	31	36	1	1	32	17
1955	V	7	8			7	4

It can be noticed from the chart that three year old fish, particularly females, were lower in numbers. This would seem to indicate that the spring of 1957 was a poor year for spawning and/or survival of fry.

The smallest fish taken was a ripe yearling male 9.8 inches in length. The smallest ripe yearling female was 12.8 inches. The largest fish taken was a female 35.8 inches which weighed 11.4 pounds. It would be expected that the 35 inch fish would be a female since males rarely exceed 24 inches. One male 25.6 inches was taken, but males of this size were very rare. Even in virgin waters, males rarely exceed 28 inches.

The age and growth of northern pike in the bay is probably a little better than the average for most states and provinces. A breakdown of the average age and growth for northern pike in Presque Isle Bay obtained from back calculating the growth, is as follows:

AGE

	I	II	III	IV	V
Females					
(length in inches)	11.3	19.4	24.5	27.7	31.1
Number of specimens	66	63	46	38	7
Males					
(length in inches)	12.4	18.7	22.2	25.6	—
Number of specimens	64	42	14	1	—
Combined sexes					
(length in inches)	11.8	19.1	23.9	27.7	31.1
Number of specimens	130	105	60	39	7

All of these fish were aged from scale samples. After the fish was weighed and measured, the scales were taken and the fish was tagged at the base of the dorsal fin. Some of the fish were so eager to get back to the spawning ground that they were recaptured four to eight days later. This meant swimming from the Erie Hatchery to the lagoon and to the west end of the bay, 1½ to 3 miles away. These tags are a clue to how fishermen can help us get information on the northern pike. Please send these tags along with the length, weight, scale sample, date and the location where the fish was caught to the Pennsylvania Fish Commission, State Fish Hatchery, Erie, Pennsylvania. This information is needed for better management and better fishing. Remember, this report is based only on the information from the work accomplished in 1960. We need the angler's aid to learn more about the northern pike of Presque Isle Bay.

NICE NORTHERN PIKE from Presque Isle Bay.



"Did You Fish for Trout in Pennsylvania Last Year?"

For several years this question has appeared on the questionnaire which you filled out or will fill out when you buy your fishing license. Another question right under it asks, "Did you do any ice fishing in Pennsylvania last year?" Why are these questions on the application? What do we hope to learn from the answers given? What have we learned to date and how can this information be used to give you the type of fishing you want most? Perhaps these and many more questions have been running through your mind since you saw these questions on the application. This will be an attempt to at least partially answer them. In another year or so when more information is available, perhaps the answers can be more definite and complete.

It has often been said that the policies of an organization are determined by a small minority who are very vociferous regarding their likes and dislikes. The majority may not agree with them but neglect to voice their opinions to the proper persons. By getting an honest answer from everyone who purchases a fishing license perhaps the desires of the majority can be determined and everyone can have a part in determining future policy.

And now, what have we found out so far? Tables I and II contain a summary of the information obtained from the 1959 and 1960 applications. It must be remembered that the answers on the 1959 applications refer to the 1958 season and those on the 1960 applications refer to the 1959 season.

Let's look at the ice fishing data first because they are simpler to interpret. For all practical purposes there was no change in the number of ice fishermen from 1958 to 1959. A change of 55 is of no significance when you consider the number of answers we are dealing with in the survey. This is a change of only 0.15 per cent. Weather can be a great determining factor as far as the number of ice fishermen is concerned. Without enough cold weather to freeze safe ice the ice fisherman is out of business. As was to be expected the highest percentages of ice fishermen occurred in the northwest and northeast regions where the majority of our lakes are located. It appears, however, that ice fishing is becoming more popular every year and a gradual increase in this group can be expected in the future.

By

JACK G. MILLER
Fishery Biologist
Pennsylvania Fish Commission

Form KCBF-1b (Rev)

COMMONWEALTH OF PENNSYLVANIA

APPLICATION FOR A



RESIDENT CITIZEN'S FISHING LICENSE

Date of Application

March 4, 1960

FEE \$3.25 PLUS ISSUING AGENT'S FEE OF 15c

NAME

John Doe

(Print plainly)

STREET OR R. F. D.

Main Street

CITY

Hometown, Penna

RESIDENT OF

Centre

COUNTY

OCCUPATION

Laborer

SEX

M

AGE

42

HEIGHT

5 FT. 10

INCHES

WEIGHT

172

COLOR OF EYES

Blue

COLOR OF HAIR

Brown

PLACE OF BIRTH

Hometown, Pa.

USA

(Post office)

(State)

(Nation)

RESIDENT OF PENNSYLVANIA SINCE

1918

(Give date)

Did you fish for trout in Pennsylvania last year?

Yes ☒ No ☐

Did you do any ice fishing in Pennsylvania last year?

Yes ☒ No ☐

I certify that the above is a true and accurate statement.

That I am a

Native-born

☒

Citizen of the United States.

Naturalize?

☐

I hereby certify that the above applicant identified himself ☒ herself ☐

and in my opinion is legally entitled to said license.

LICENSE NO.

(Signature Issuing Agent)

The question concerning persons who fished for trout is more complex, and care must be taken in attempting to evaluate the results. However, certain apparent figures can be presented for thought. The entire drop in resident fishing license sales might be attributed to a decrease in the number of trout fishermen. The number of persons who stated they did fish for trout dropped nearly 54,000 from 1958 to 1959, while during the same period the number of persons who stated they did not fish for trout increased nearly 33,000. The loss in license sales during this period was approximately 18,000, or about equal to the difference between the decrease and increase of the two groups of fishermen. It appears that a large number of persons, who were previously trout fishermen, fished solely for warm-water species in 1959; and another group of "trout fishermen" just didn't buy a license at all in 1959.

Is it possible to account for this drop in the number of persons who said they fished for trout? A news release in early 1958 stating that there would be fewer trout to stock in that year was the main reason given by many persons for the license sales drop that year. If news releases are this effective, then the one released in April, 1959, stating that nearly 2¼ million trout of good size would be stocked in 1959 should have caused an increase in license sales. Such was definitely not the case, in fact, while there was an increase of 19 per cent in the number of trout stocked there was an accompanying decrease of 7 per cent in the number of licenses sold. This seems to indicate that putting more trout into the streams is not necessarily the way to increase the number of fishermen. If there is not a positive correlation between the number of trout stocked and the number of trout fishermen, then the whole concept of increasing trout production so that more people will buy licenses is fallacious.

Another point that is worthy of consideration is that slightly less than half of the license buyers stated that

they fished for trout at all. How many of those who said they fished for trout spent some or most of their fishing time seeking the warm-water species cannot be determined from the available information; however, in certain sections of the state it is quite apparent that when the warm-water game species are in season, trout fishing falls to a poor second. What would be your choice if you were limited to one type of fishing or the other?

Basically that is what we have learned to date but perhaps a little about how we arrived at the figures given in Tables I and II would be in order. The wardens collected all available applications from the issuing agents at the end of the year and delivered them to their respective regional offices. There were over 600,000 license applications collected for both 1959 and 1960, and it would be an almost endless task to attempt to go over each application. It was, therefore, decided to take a sample which would be representative of the total number of applications and expand these data. Dr. Henry Fortmann, Statistician at the Pennsylvania State University, was consulted and designed the sampling technique used for the study.

The year was divided into two periods, one from March 1 to August 31 and the other period to include the rest of the year. The purpose of the two periods was to insure that an adequate sample of the answers to each of the questions would be obtained. Naturally the period which includes January and February would be expected to include most of the ice fishermen and the early part of the other period would include most of the trout fishermen. From each of these two periods a sample of 500 applications was drawn in such a manner as to ensure that the sample would be representative of all the applications for the period.

Answers to the questions were then tabulated for the two periods in each of the six regions. Due to the great difference in the number of applications for the two periods it was impossible to arrive at an accurate regional average by merely averaging the periods. Therefore, a weighted average was obtained for each region. Table I gives the weighted averages for the regions for the years of 1958 and 1959. Furthermore, it was not possible to average the regional percentages to get a state average because of the great difference in the number of licenses sold from region to region. Therefore, the number of licenses sold in each region was broken down into positive and negative answers by using the percentages given in Table I and from the sum of these figures it was possible to arrive at a reasonable estimate for the whole state. Table II gives this expanded data for each region and for the whole state for the seasons of 1958 and 1959.

As was stated in the beginning, the same two questions are appearing on this year's applications. Again your cooperation is requested in filling them out properly and completely. The type of fishing you will have in the future may depend partially on how you answer these questions.



TABLE I

Weighted Data for the Years 1958 and 1959 Obtained From
Answers to Questions on Fishing License Applications
for the Following Year

1958

Region	Trout Fishing		Ice Fishing		March-August Weight Factor
	Yes	No	Yes	No	
NW	46.0%	54.0%	7.8%	92.2%	6.4
NC	75.7%	24.3%	2.0%	98.0%	11.2
NE	50.0%	50.0%	11.6%	88.4%	4.9
SW	57.3%	42.7%	3.6%	96.4%	8.3
SC*	64.1%	35.9%	2.8%	97.2%	6.8
SE	58.8%	41.2%	6.3%	93.7%	7.9

* From complete data

1959

Region	Trout Fishing		Ice Fishing		March-August Weight Factor
	Yes	No	Yes	No	
NW	42.9%	57.1%	9.4%	90.6%	8.7
NC	69.9%	30.1%	1.3%	98.7%	12.8
NE	51.9%	48.1%	12.8%	87.2%	6.0
SW	54.6%	45.4%	4.3%	95.7%	10.0
SC	59.5%	40.5%	2.8%	97.2%	3.6
SE	40.3%	59.7%	4.8%	95.2%	2.3



TABLE II

Expanded Data From Percentages on Table I
According to Regional License Sales

1958

Region	Number of Licenses Sold	Per Cent of Total License Sales	Trout Fishing		Ice Fishing	
			Yes	No	Yes	No
NW	90,646	14.59%	41,733	48,913	7,034	83,612
NC	51,626	8.31%	39,081	12,545	1,043	50,583
NE	91,540	14.74%	45,770	45,770	10,609	80,931
SW	175,898	28.32%	100,825	75,073	6,385	169,513
SC	29,853	4.81%	19,145	10,708	848	29,005
SE	181,582	29.23%	106,697	74,903	11,512	170,070
State-wide	621,145	100.00%	353,233	267,912	37,431	583,714
Percentages			56.87%	43.13%	6.03%	93.97%

1959

Region	Number of Licenses Sold	Per Cent of Total License Sales	Trout Fishing		Ice Fishing	
			Yes	No	Yes	No
NW	92,791	15.37%	39,807	52,981	8,722	84,069
NC	48,421	8.02%	33,846	14,575	629	47,792
NE	90,753	15.04%	47,101	43,652	11,616	79,137
SW	164,981	27.34%	90,080	74,901	7,094	157,887
SC	30,086	4.98%	17,901	12,185	842	29,244
SE	176,514	29.25%	71,135	105,379	8,473	168,041
State-wide	603,546	100.00%	299,870	303,676	37,376	566,170
Percentages			49.68%	50.32%	6.19%	93.81%

Pennsylvania's New MUSKELLUNGE Program

Part II—Angling Tips

(Conclusion)

Pennsylvania Fish Commission photos—Johnny Nicklas

To tell or show someone how to catch muskies by writing is much like taking a correspondence course in "How to Catch a Ghost." This is not to imply a musky is hard to take . . . it's just that he isn't fooled very often. But then nobody can say how, when or where you'll have one of these "tigers" of fresh-water fishes up and nail the daylights out of whatever you have hanging on the end of a line at the moment. In whatever moment it occurs it will be the "moment of truth."

In Section 1, via the table of muskellunge plantings in Pennsylvania, you can see the present widespread territory now offering a crack at these lunkers. Note please, how many anglers now figuring they're in muskyland will, by respectful apprehension, slide from 6-pound test line to 10-pound and up . . . "just in case." Well, . . . there are a lot of "just-in-cases" where the muskellunge is concerned and if all the answers of a million anglers were put together it could hardly solve the riddle of an infallible method of catching this fish.

With this in view a few tips as to rods, lines, baits, etc., can only be offered novice musky mechanics as guides. Perhaps the greatest bits of equipment necessary for fooling around with these "toothed" gents are: 1) Determination; 2) Experience; and 3) Patience of which there should be in large measure.

Methods and Procedures

Where to fish for muskies? In water where they are known to be present, one is likely to be found almost anywhere. Weed patches and stumpy areas deserve the greater play.

And while muskies have favored the business end of just about every conceivable lash-up via methods of fishing that run the gamut from the throw-line on up, casting and trolling are the methods employed when the true musky fisherman is at work.

Pinpoint casting in open patches and along weed beds and stump areas pays the greatest dividends. This, whether a lure or live bait is being used. "Pinpoint" is emphasized, as a weed bedecked lure means just that much less probability of a musky. Trolling along such areas could also prove equally effective. Though shore-lines get the greatest play, drop-offs and bars, when their locations are known to the angler, deserve a thorough going over.

The length of a cast or the distance behind the boat a lure should be trolled are two factors that elicit diverse opinions. Fifty feet in each instance is the optimum. Up to this distance, greater casting accuracy is possible and this is important. While trolling, better direction and control of the bait or lure is similarly possible. More often than not, the lure must pass fairly close to a musky to arouse his interest.

Another factor is that muskies, like bass, are sometimes attracted to the disturbance created by a paddle or oar or motor prop. The lure, therefore, coming close behind, may be taken by the aroused fish.

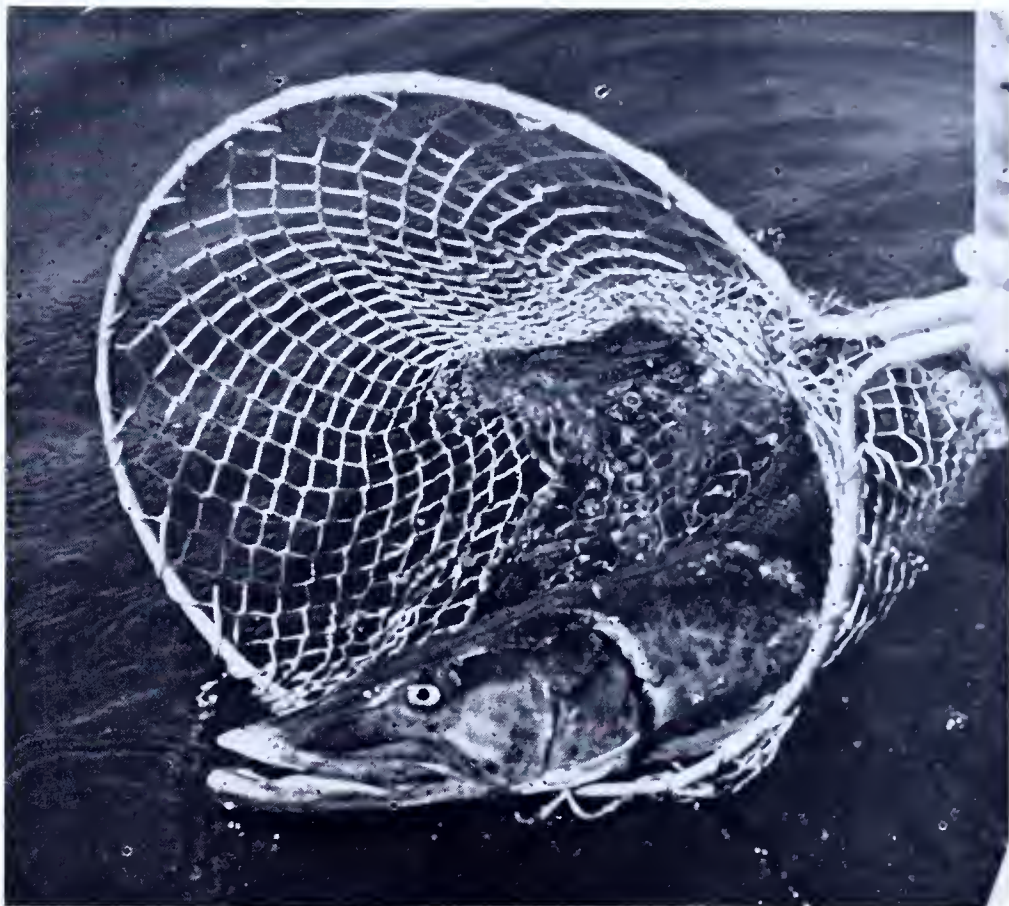
Tackle

Rods. Rods of glass are most readily available and represent about the best rod buy since the fabricated rods of any sort were first placed on the market.

A five-foot to five-and-one-half-foot rod of stiff action gets the nod of majority musky fishermen. Rods of this type better handle the heavier lures that are used for this big fish. Also, a stiff rod facilitates setting the hook in a musky's really hard mouth.

Whether the handle portion is of the one- or two-hand grip variety, may be left to the angler. If he is a muscular individual, the conventional single-grip style is totally adequate. For fishermen of slighter builds or whose occupations are not conducive to moulding mus-

STOUT TACKLE, "stout fellas" tangle with wicked, powerful muskies . . . sample shown! Anglers are advised to keep fingers out of that sharp-toothed mouth!



cles, the two-handed grip—a modification of the surf casting rod—will be found to be a great comfort.

But if the pocketbook does not allow one special rod for muskies, a stout all-purpose bait casting rod or standard spinning rod will do. However, with the long, limber spinning rod in the hands of most fishermen, the fish is the boss. In the hands of an expert—a patient expert, that is—it's no problem. In fact, a 37-lb. musky is recorded to have been taken in Wisconsin in 1955 on a standard spinning outfit with 6-lb. test monofilament.

Reels. If yours is to be a standard bait casting outfit, there are just two considerations. It should be a sturdy reel of better quality and should be geared of a material that will stand the strain of casting heavy lures and the pressures of these heavy, powerful, speedy and slashing adversaries. And to avoid skinned knuckles from wildly spinning handles when the "tiger" suddenly decides to put more water between himself and you, fit it out with rubber handle grips.

If you want a heavier reel, and there is no shame to heavier gear with muskies, as they give no quarter and deserve none, several manufacturers now produce smaller than the deep-sea variety reel, incorporating the star-drag feature. This type reel is a very practical buy, as it may also be used for deep lake trout trolling and light salt-water fishing—sea trout, blue fish, etc.

The same reel properties—sturdiness and material-wise—apply if you will be using the spinning approach.

Lines. The fisherman's ability and the type of water

area in which he will be fishing, whether characterized by stumps, weeds or rocks, will dictate the weight of the line recommended. The pound test may range between 18 and 30.

A safe rule to follow up to this point is to have a good, stout rod and reel and a heavy line. You can then concentrate on the musky, as you will have to, with no concern for tackle.

Lures. Here you're allowed the most leeway as there are many "proven" musky lures on the market today, with more due to come. A few of the more notable are pictured in June 1960 issue. Also, some fishermen have devised their own and swear by them with good cause (see "You've Got to Specialize," by Bill Walsh, in the July, 1958, *ANGLER*). Then there are times when a cast or trolled live sucker up to 10" long, the favorite of many musky fishermen, will produce best. Chubs and frogs afford a change of menu.

All of this, however, is not to suggest that other lures or baits of lesser sizes and types are not productive. A splendid fish was taken from the Allegheny River on a worm. Another was taken from the same water area near Franklin on a June Bug spinner and worm combination.

Leaders and Swivels. The rule for swivels is the same as for rods, reels and lines—stout and sturdy. This quality in leaders, however, is generally overdone. The "test" of the leader need be little more than the line, though it should be of wire, either cable or preferably

**See Part I—August Issue—Center
for Map of Pennsylvania Muskellunge Waters**

RECORD OF MUSKELLUNGE PLANTINGS—1960

<i>County</i>	<i>Water Stocked</i>	<i>Fingerling</i>	<i>Adult</i>
Bedford	Gordon Lake (3)*	500	
	Shawnee State Park Lake (1)	1,000	
Bradford	North Branch Susque- hanna River (1)	400	
Centre	Bald Eagle Creek (4)	190	
	Moshannon Lake (5)	1,000	
Clinton	Bald Eagle Creek (4)	170	
Crawford	Canadohta Lake (NP)	500	7
	Conneaut Lake (NP)	800	9
	Pymatuning Reservoir (5)	600	1
	Pymatuning Sanctuary (4)	2,069	
	Cussewago Creek (NP)	300	
Erie	Drakes Mill Dam (1)	150	
	LeBoeuf Lake (NP)	1,100	4
	Edinboro Lake (NP)	1,100	4
Forest	Conneaut Creek (1)	100	
	Tionesta Flood Control Reservoir (NP)	1,000	
Greene	South Fork Ten Mile Creek (6)	200	
Huntingdon	Raystown Dam (3)	1,000	
Lancaster	Safe Harbor Dam (3)	1,000	
Lawrence	Neshannock Creek, Big (1)	200	
Luzerne	Lake Jean (2)	1,000	
Mercer	Shenango River (1)	150	
Pike	Lower Promised Land Lake (1)	500	
Snyder	Middle Creek Dam (3)	100	
Somerset	Somerset Lake (1)	500	
Tioga	Hill's Creek Dam (3)	300	
Washington	Dutch Fork Lake (2)	975	
Wayne	Gouldsboro Lake (3)	600	
Wyoming	North Branch Susque- hanna River (1)	400	
York	Governor Pinchot State Park Lake (1)	1,000	
	York Haven Dam (3)	1,000	
	Total	19,904	25

*Figures in parenthesis denote the number of years muskellunge have been stocked. For example, Governor Pinchot State Park Lake (1) received the initial introduction in 1960 whereas this is the third year that Gouldsboro Lake (3) has been stocked. "N. P." denotes planting in a lake having a native population of muskellunge.

single strand. A leader of wire will best resist the abrasions of the mouthful of teeth a musky sports and the cutting edges of its hard gill covers. Also, a leader of this type better stands the wear that is inflicted on a lesser material through contact with weeds, rocks, stumps, etc. The heavy cable-type leader should be avoided as it inhibits and sometimes destroys entirely, the "built-in" action of most lures.

Gaffs and Nets. The rule again is simple—big and strong. A musky landing net should present a large mouth, a deep net of heavy linen or nylon twine and a strong, long handle, preferably of aluminum for lightness. A net of linen twine should be tested before each outing to be certain that a good sized fish will not be able to punch his way through it.

If you lean to the gaff as a landing device, a long one-piece aluminum tube handle is best. Avoid the telescope type.

The gaff hook should be of good steel, the point of which should be kept sharp to penetrate hide if necessary. Usually, however, quietly slipping it into the gill opening is sufficient. One precaution: impale a cork on the point as a safety measure. This guard can easily be bumped off against the seat or gunwhale before pressing it into action. The alternative might be a punctured leg or butt, either of which could have dire consequences in addition to ruining a day's fishing.

Persistence

Persistence, more than any other characteristic a fisherman may possess, is the keynote to musky fishing success. In a recent report on the Ohio muskellunge program, 1948 to 1958, by Ray H. Riethmiller of the Ohio Division of Wildlife, it was stated that the average time devoted to account for one musky in Ohio was 100 hours of fishing, and this by "specialists." The rate decreased to one musky per one thousand hours of fishing for those of lesser talents. In other waters claims of one musky for every 8 to 10 hours of fishing have been made.

Just how complete or accurate such figures are would be most difficult to substantiate, because musky fishermen, unlike their brothers concerned with the "lesser" species, are not prone to brag. As stated at the outset



TYPICAL MUSKY water—but many more waters of Pennsylvania have become “home” to this fighting tiger, a target increasingly sought by Pennsylvania anglers.



here, many hide their enthusiasm and their successes, lest they get too much company.

Random Tips

Best Times. The four-hour period between 8 a.m. and noon and the period between 2 p.m. and dusk are the times to which most guides seem to subscribe and during which most record muskies have been taken.

Retrieving the Lure. Have the lure moving back to you as soon as it hits the water and keep it coming at a good clip. However, during the last 8 or 10 feet of the retrieve, slow up a bit. A fish may be following and this change of pace may just do the trick. If a follower is noted and he fails to fall for the slow-up stratagem, reel the lure to within a foot or two of the rod tip and do a figure 8 with the lure. If that doesn't work, lift it quietly from the water and cast again to the same spot. A musky will usually return to his resting place and he may take on the second or third trip by or hold off as long as the tenth cast. If he doesn't accommodate you, mark the spot and come back later.

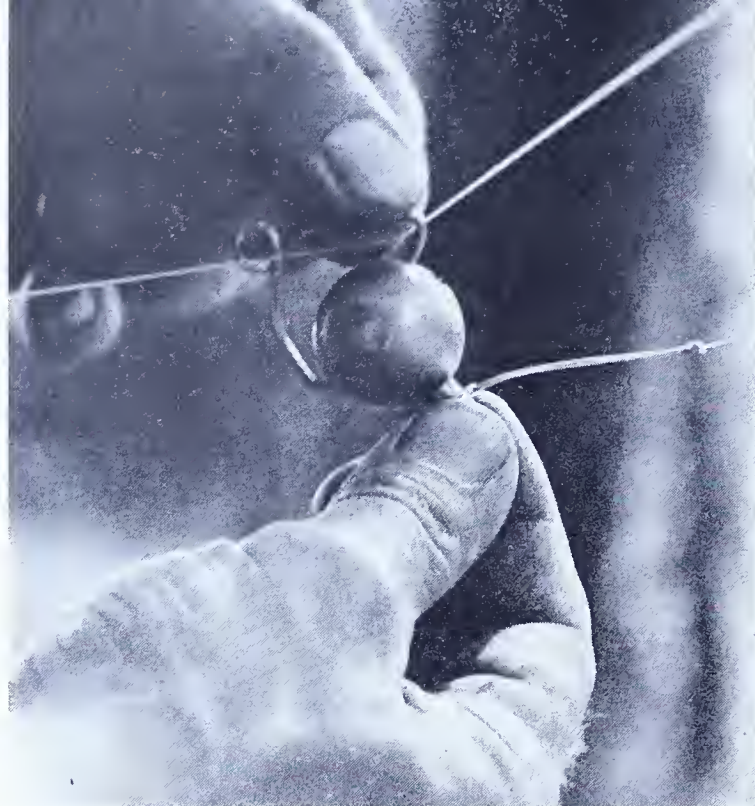
Keep Alert. Keep your eyes on your lure or in its direction at all times on every cast. Be ready to react instantly. A V-shaped wake or a bulge or swirl is the tip-off that something big has shown interest.

Check Tackle. Periodically inspect guides to assure they are clear of obstructions and free of grooves or cracks that could weaken the line. Be certain that all reel parts, including screws, are secure and functioning properly. Be certain that the knot attaching the line to the swivel is right and firm. Check the full casting length of the line to be sure that it is worn or frayed at no point.

Tight Line. The musky more than any other fish, save possibly the smallmouthed bass, will take instant advantage of a moment's slack line. Keep it tight at all times and endeavor to wage the battle at close quarters. But under no circumstances even when about to net or gaff the fish, reel it closer than four to five feet from the rod tip. The shorter the line between the rod and the fish the more leverage the fish has. And it's at the boat when a musky's lunges are most vigorous and desperate. Also, if it darts under the boat, such a length of line will enable you to swing over and around the bow or stern, with a minimum risk of fouling the line on the boat or motor.

Sit Down. This is a cardinal rule for any boat fisherman, and mainly for reasons of safety.

Hands Out of Mouth! One look at the array of teeth a musky wears should be warning enough against venturing in that mouth with bare hands for whatever reason. Therefore, removing the hook should only be done with a pair of long-nosed pliers or a practical hook remover. And when about it, prop or wedge the mouth open with a stout stick in a manner that it won't slip, for if perchance, that mouth would clamp shut, the unwary fisherman is in trouble. The teeth are many, sharp and hard and the jaw is a powerful one. When freed, the hand will have more punctures than a colander has holes. Or it could be skinned as completely as a peeled banana. Or a finger could be severed almost cleaver clean. Even a single puncture from one of those teeth is cause for concern. If it does happen, bleed it well and treat it as you would any puncture wound to avoid infection.



RETRIEVING DEVICE is made from scrap material, basically a brass ball measuring one inch in diameter with a wire holder for the fishing line and an eye screw. Here's how it works. The wire is pulled from the socket and placed over the line.



WEIGHT OF BRASS BALL carries down the line into water toward snagged lure. Line tied to eye screw lets angler bump ball against lure, also retrieves ball in event lure is snagged beyond salvage.

Bump 'em Loose'

(By DON SHINER)

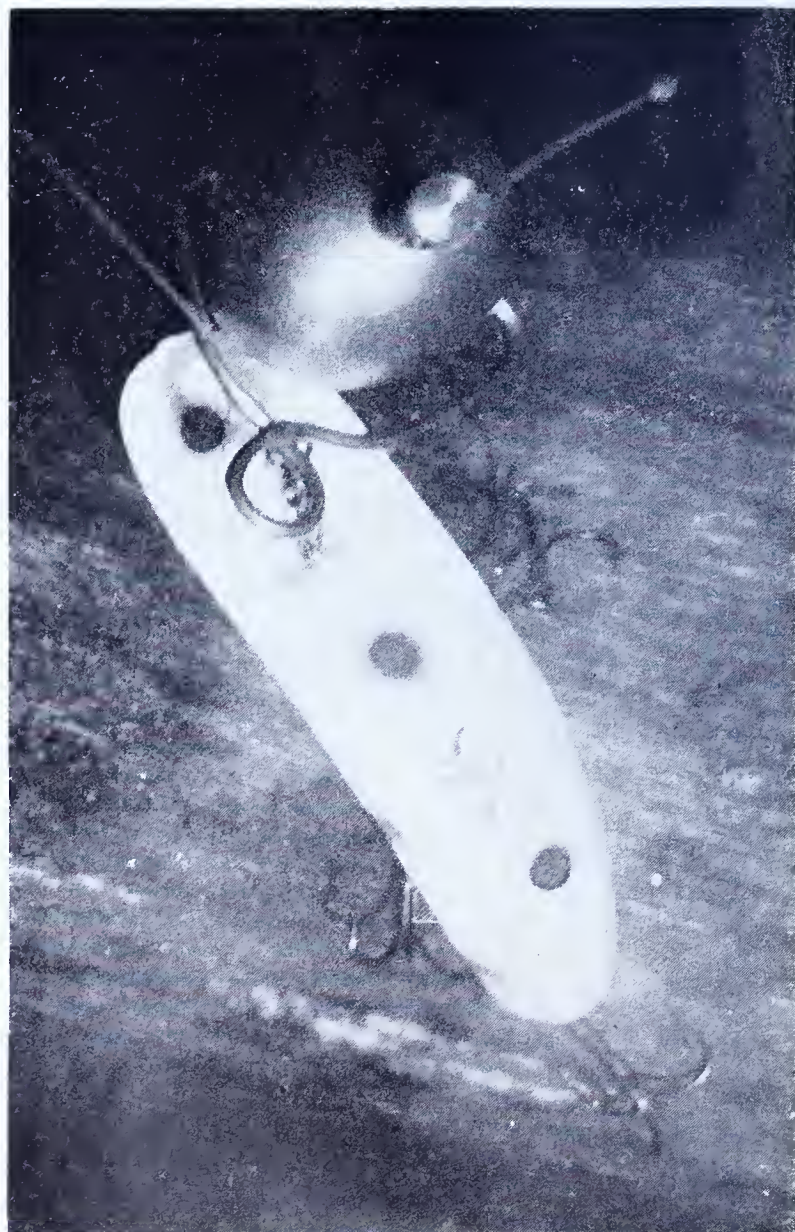
At a dollar a throw for plugs, spinners, spoons, lures of all kinds, a guy doesn't lose very many until he's out a sawbuck. Almost every angler, at one time or another, has gotten hung up on something that refused to let go. Rocks, logs, old boots or a sunken oil drum can be mighty stubborn. Not so when you use the "Ding-Bust It."

This retriever is designed especially for getting your money and plug back when snagged. Nobody else is gonna get it back for you.

All you need do is to take the Ding-Bust It from your pocket, clip it on your line, let it slip down until it reaches the plug. Then bounce the ball against the snagged lure until it's knocked free.

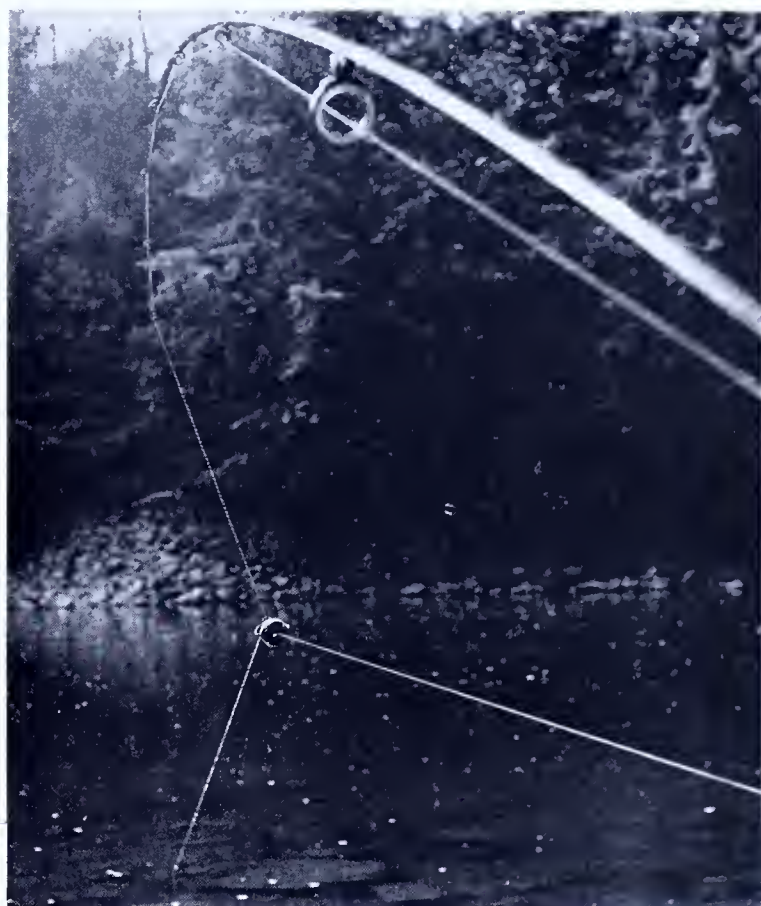
This is the answer to an angler's prayer when he's snagged in deep water. Even the most stubborn plugs can be retrieved and if the hooks are bent you can easily replace them at low cost.

Study the plan, use whatever material is available and carry this handy thing in your tackle box or fishing vest. Next time you get snarled or have hold of something real big, BUMP 'EM LOOSE!

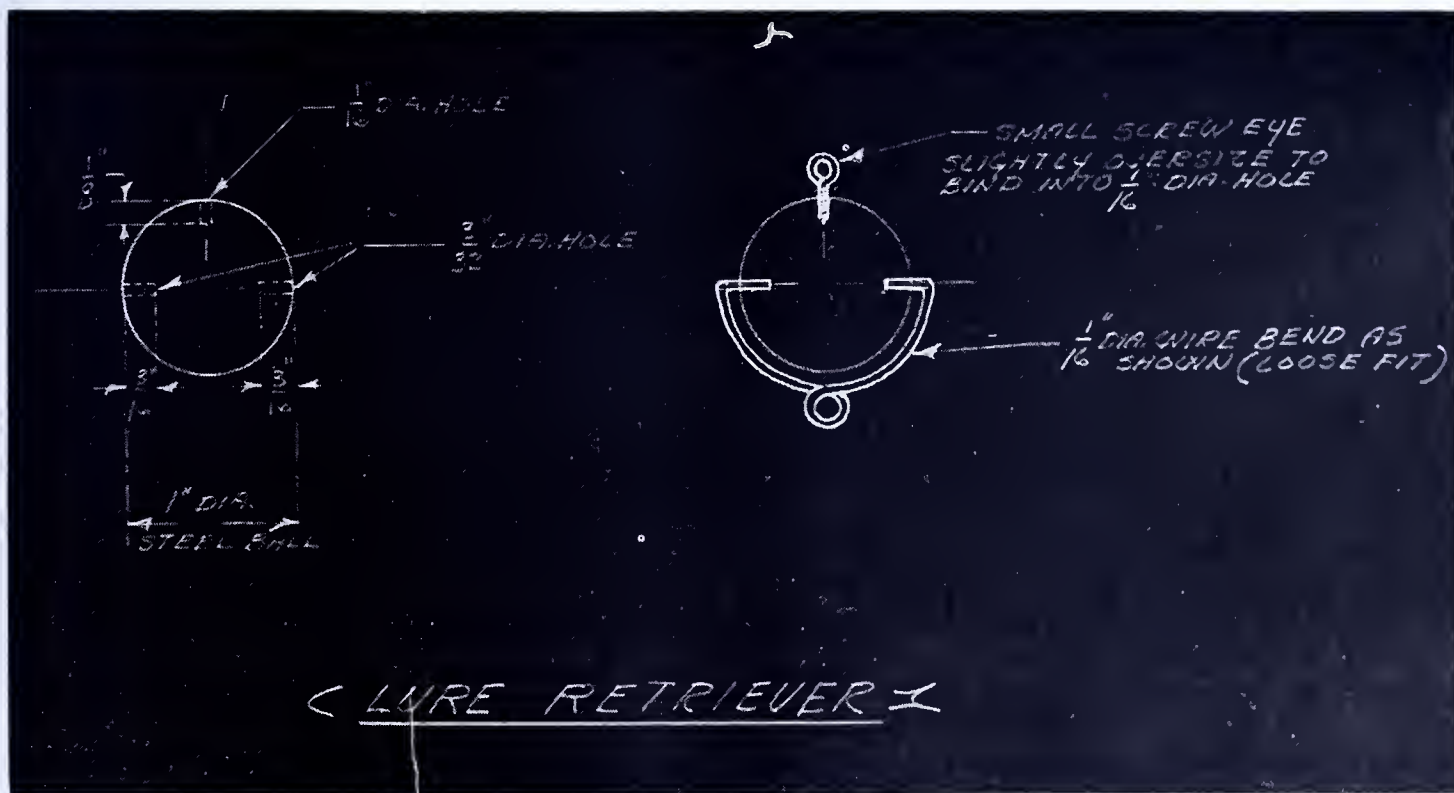




WRITER LOWERS BALL down line to snagged lure. This outfit has salvaged dozens of lures he previously lost. This can get expensive.



NO HELP for retrieving lure from trees, anglers are urged to keep plugs out of trees but it is good on lakes, creeks and rivers especially in deep water.



PLANS SHOW HOW ball is made. Easily carried in a shirt pocket, it's ready for action any time your lure gets snagged.

BUMPED against hooks jars
the loose, then retrieving line
re back to angler.



Your Insurance—The Warden

By PAUL ANTOLOSKY

**District Fish Warden
Centre County**

Over a period of time while working and associating with the sportsmen of Pennsylvania, it has often occurred to me that many of them do not really understand the actual function of the Pennsylvania Fish Warden. Since it is the sportsmen themselves, who, through the purchase of a fishing license, indirectly pay the salaries of the Wardens throughout the state, I believe they should know what they are receiving for their investment. Perhaps the following information will help to clarify some of the confusion that seems to exist in the minds of many sportsmen.

Let's start from the beginning. In 1903 there were only six Fish Wardens for the entire state of Pennsylvania; today, there are fifty-one districts with a Warden for each district. Along with this, there are six divisions, a Warden Supervisor for each division, the Chief Law Enforcement Officer located in the Harrisburg office. In earlier times, the Warden sometimes having as many as eight or ten counties in his district, was not always available when needed. Today, however, your Warden is in close contact with the sportsmen whenever the need arises for one of his many services.

The Fish Warden's duties are many and varied and he is always striving to assure better fishing opportunities. Law enforcement still takes up the largest percentage of his time; his main concern here is to see that a fair share of the sport is enjoyed by all. Technical arrests for violation of the Fish Laws are his method of being just for the lesser infractions. The habitual violator, however, is more often than not, on the losing end of the game. Your Warden is adequately trained in law enforcement procedures, attesting to the fact that

in a recent year less than 5 per cent of all fish law violations found their way into the courts. This is an enviable achievement, and one where you, the sportsmen, benefit.

Many times sportsmen complain bitterly of violations they have personally witnessed. Instead of stopping to realize the violator is a thief, as surely as if he were stealing any of their personal possessions, most sportsmen simply ignore this and make a complaint, often too late. Certain rules and regulations concerning fisheries management must exist to assure the best benefits possible to you, the fisherman. Your Warden is necessary to enforce these laws.

Pollution is another great concern of your Warden. Always on constant vigil, he is your best insurance against stream pollution. Strip and deep mine drainage applications are all carefully inspected and reports filed of possible adverse effects on the fish populations of the streams concerned. In cases of fish kills, he is available to help determine the cause and resulting effects. All regular Fish Wardens are acting field deputies for the Department of Health, work in close cooperation with this department.

In this particular phase of his work, I cannot think of anyone more important to assist him than you, the sportsmen. Let me clear this point. Let's assume we have 500,000 fishermen in the state. If only one-fifth of these fishermen would be on the lookout for pollutions when outdoors, it would mean there would be 100,000 interested people helping to preserve what is rightfully theirs—CLEAN WATERS.

I am sure the parties responsible for polluting many waters maliciously, would hesitate if they were aware so many persons were concerned and interested enough to report these pollutions. Remember, again these are your interests with which the Warden is concerned. If enough of you could be aroused to this way of thinking, I am sure we would be moving in the right direction. If this interests you enough, give your Warden a call and ask him what you can do to help. He'll gladly give you the information and instructions on this subject.

Public Relations and Conservation Education is another service offered you through your Warden. Your club having a meeting and in need of a program? Your Warden is available with a movie or a lecture. Many times a simple "Question and Answer" session has proved to be very interesting.

Have a stream in your area that needs a little stream improvement, and who doesn't? Your Warden is there to assist and guide you with the proper methods and advice. This subject is also one in which you can help to better your sport. It takes a little sweat and labor, but just catching one fish in a stretch of water that you helped to improve is well worth the effort.

I have often marveled at what lengths sportsmen will go in winter game feeding programs. This is truly admirable, but I have often hoped that just a little part of that enthusiasm could be directed toward stream improvement. To my way of thinking, a small trout stream

FISHING LICENSE DISPLAY LAW PASSED

Governor David L. Lawrence recently signed into law a legislative bill which requires that the fishing license must be worn on the outer garment of the licensee.

The law, which becomes effective September 12, 1961, specifies that the license must be displayed at all times while the licensee is fishing. The law does not specify any particular type of holder for the fishing license. It is expected, however, that most anglers will use some sort of transparent plastic holder to pin the license to an outer garment.

in the late summer months is as critical for its inhabitants as the severest winter months are for the deer and turkey. Stream improvement is important if you want your fishing possibilities bettered. This is also an excellent club project for the "do-it-yourself" type of sportsmen's club.

Assisting Fish Commission biologists is another duty performed by your Warden. Stream surveys, electroshocking to determine fish population, stream investigations, and future dam sites have often been initially started by the Warden. Attending technical classes on fishery management problems, latest law enforcement procedures and motor boat safety and operation classes are also included in the Warden's line of duties; all of which are directed to benefit you, the sportsmen of Pennsylvania.

What kind of an individual is your Fish Warden? I would most certainly declare him a "dedicated conservationist." Competitive examinations prove these men possess intelligence, sound judgment, and a better than average knowledge of outdoor life. Many of them could surely be making higher wages elsewhere, working regular hours, and often excepted from unfair criticisms. This is a tightly knitted group of men with fierce pride, to protect and conserve your interests. The main objective of the Fish Commission is to perpetuate the sport of fishing in Pennsylvania, and your Warden is a vital part of this operation.

Get to know your Warden. Take advantage of the many services he has to offer. Your Warden of today is much more than the "Fish Cop" of yesteryear. Working with him, helping to protect your interests, will benefit your future in the great outdoors for you and your children.

In these hectic days of fast living and space age achievements, there is still one positive way to relax and ease the tensions. . . . Go fishin'.

*Over me soared the eternal sky,
Full of light and deity;
Again I saw, again I heard,
The rolling river, the morning bird;
Beauty through my sense stole;
I yielded myself to the perfect whole.*

—Emerson

Pa. Legislature Pays Homage to H. R. Stackhouse

Senate Resolution Honors "Mr. Fish Commission"

In the Senate, August 28, 1961

Henry Reid Stackhouse (affectionately known to sportsmen throughout Pennsylvania generally and to fishermen in particular as "Stackie" and to Pennsylvania's citizenry as "Mr. Fish Commission") retired on January 1, 1961, after almost five decades of continuous service, leaving a post he first took in 1913.

His deep anchorage in the finest traditions of Pennsylvania State public service, his inspiring dedication to the cause of Pennsylvania's world leadership and concomitant dissemination of knowledge in the field of fish culture, his continuous and exemplary attainments in various important positions under every Executive Director of the Fish Commission except one, beginning with the "long ago" of 1923 and ending in 1960 when he was appointed Acting Executive Director, constitutes H. R. Stackhouse (as he prefers to be known), a living legend that should be paid homage by the Senate of Pennsylvania in behalf of the people of Pennsylvania.

A person of profound humility, affable, thoughtful, courteous and considerate, speaking in monosyllables and always self-effacing, Henry Reid Stackhouse comes squarely within Emerson's immortal definition of what constitutes a true gentleman. Those who have met and known Mr. Stackhouse have become richer, for no one could escape the ennobling touch of warmth, charm and dignity with which this fine gentleman was abundantly blessed and endowed.

The high regard in which public servant "Stackie" is held is illustrated by the fact that sportsmen's organizations throughout the state have urged his appointment as full executive director. The Pennsylvania Fish Commission has offered him the top spot in that agency, but he has declined. "I've had a full and compensating life with the commission; I'm not ambitious; I'm happy as I am," replied unusual public servant Henry Reid Stackhouse.

Having retired after nearly five decades of public service that have witnessed Pennsylvania's steady march in the very vanguard of our Nation's progress, Mr. Stackhouse owes to the people of Pennsylvania a duty of reducing his rich memoirs to a book that could enrich our lives with its inspiring contents.

BE IT THEREFORE RESOLVED that the Senate of Pennsylvania on behalf of the people of Pennsylvania pay homage to a great Pennsylvanian, Henry Reid Stackhouse, whose invaluable public services have contributed over almost five decades to Pennsylvania's progress, by enriching our economy and setting an unexcelled example for emulation by our State employees.

AND BE IT FURTHER RESOLVED that the Secretary of the Senate forward a copy of this resolution, upon its passage to Henry Reid Stackhouse, now a resident of Harrisburg, Pennsylvania.

Penna. Outdoor Writers on Susquehanna Float Foray



Flotilla at Towanda.



Warden Willard Persun leads raft string through rain.



Nice walleye hits net for Francis Kemp and son.



Knocking off—replacing pins was routine.



Cruisin' down the river.



It's all over—loadin' up!

Fifty Writers, Guests, Thrash River

**By Russell S. Orr, Chief
Conservation Education Division**

The Pennsylvania Outdoor Writers float trip down the Susquehanna River, July 13 to 16, was a huge success in spite of a heavy rainfall which lasted throughout most of the second day. More than fifty writers and their guests floated and fished the river from Sayre to Tunkhannock. The writers were guests of the Endless Mountains Association, Chambers of Commerce and sportsmen's groups of the communities within the tour area.

The trip, which was sponsored by the Endless Mountains group, was planned and directed by its president, Myron Shoemaker. The float trip was arranged as a means of promoting interest in tourism and other recreational facilities of the upper Susquehanna area.

The Fish Commission was represented by its executive director, Albert M. Day, and Russell S. Orr, Chief of the Conservation Education Division. The Commission cooperated in the program by providing outboard motors and boats for the use of many of the writers. Warden Supervisor H. Clair Fleeger and wardens Willard G. Persun and Stephen A. Shabbick assisted and guided the visitors.

Tidioute Will Again Host State Fishing Tournament

**By Lenore N. McIntyre
Editor, Tidioute Observer**

For the second consecutive year Tidioute will play host to the anglers of the state when the 1961 Pennsylvania State Fishing Championship Tournament is held October 14-15 in this small northwestern community on the Allegheny River. The Tidioute Area Chamber of Commerce initiated the event last year and a very successful venture resulted.

The same rules set up in 1960 will govern this year's contest. Any fisherman in the state, man, woman or child, is eligible to compete. On Saturday, October 14, the elimination round will be held. On this first day of the tournament, from 8 a.m. to 10:30 p.m., contestants may fish anywhere on a twenty-mile stretch of the Allegheny between Irvine and West Hickory bridges. Catches will be registered at the weigh-in station in Tidioute.

First and second place winners in the four classes (muskie, northern pike, walleyed pike and bass) will be eligible to compete in the finals on Sunday, October 15. Weight will be the determining factor the first day and judges for both days will be well-known sports writers and editors.

The eight finalists will be announced Saturday night and will take to the Allegheny the following morning at 6 o'clock. Each of the contestants will be accompanied

by a referee, chosen by lot, who will tally the angler's Sunday catch, based on a scoring system allowing 20 points for each muskie, 15 for northern pike, 4 for walleyed pike and 2 points for bass. Boats may be used and all Pennsylvania Fish Commission laws will apply both days.

The contest ends at 2 p.m. Sunday when finalists must leave the river. Individual score sheets will be tabulated by the judges and the winner announced. Climax of the tournament will be afternoon ceremonies, starting at approximately 3 o'clock, when the winner will be crowned "King of Pennsylvania Fishermen." He will receive a large, handsome trophy and \$100 in cash from the Chamber of Commerce, and be eligible to compete in the 1961 World Series of Sport Fishing, which is to be held this year on the last weekend in October at Grand Lake O' the Cherokees, Grove, Oklahoma. All those who participate in the Sunday finals also will receive an array of valuable prizes.

The winner of last year's tournament is expected to be on hand to defend his crown. He is Marcel Tourdot, a 58-year-old, round-faced bespectacled little coal miner from Vestaburg, Pa. Mr. Tourdot hooked a 19-inch, three-pound black bass on the first day, largest entered in that species. However, it took some persuading to convince Mr. Tourdot he should register his fish and remain for the final competition on Sunday. He stayed, he won the contest, and then took the all-expense-paid tour to Houghton Lake, Michigan, where the 1960 World Series of Sport Fishing was held. Here, he placed third in the international competition.

In conjunction with last year's competition in Tidioute, the Pennsylvania Fish Commission conducted a management survey which involved collecting samples of scales from each registered catch. Albert M. Day, executive director of the Pennsylvania Fish Commission, has accepted an invitation to be present in Tidioute for the 1961 Pennsylvania State Fishing Tournament.

Susquehanna Carp Now Jingle \$10 Tags

Television Station WGAL of Lancaster has extended its fishing contest to include 200 carp bearing \$10 tags.

According to Paul Woodland, promotion manager, the carp, all natives of the Susquehanna River, have been tagged and released from Danville to the Conowingo Dam. Woodland said the tags used for the carp contest will be redeemable during both 1961 and 1962.

Another Doughball

Here's a good catfish and carp bait easy to make. Use 2 or more slices of whole wheat bread, make real soggy with syrup. Add white flour and knead to consistency desired. Vanilla may be added. This bait stays on the hook and will keep if refrigerated.—*Jack McMaster*

*I had slept and dreamed that life was duty.
But waked to find that life was beauty.*

Boating

Boating Clubs Popular

Man has a natural desire to be with others. This probably explains the remarkable growth of outboard boating clubs throughout the country. Novice boaters, as well as seasoned veterans, are finding that membership affords them the opportunity to enjoy their boating more fully.

Most members are attracted by the many social activities the club offers. The well organized group will have something planned for every weekend during the season as well as several special events throughout the entire year.

Group cruising is one of the most popular activities, for it gives the members a chance to visit unique waterways they would probably never see on their own. Picnics are always a favorite as they provide an opportunity to get acquainted and to swap stories and ideas. Most clubs also feature such things as water skiing parties, twilight cruises and fishing derbies.

Boating clubs are more than just "fun clubs," how-

ever. They have, as their prime objective, the furthering and betterment of outboard boating. This often takes the form of active club support either for or against various proposals that come up. Such matters as current legislation, tax situations, proposed facilities and the like are discussed and an appropriate course of action is decided. Organized clubs are quite influential in helping to set boating policies on local and state levels. More directly, they are often responsible for the construction of public launching ramps and docks in their immediate area.

It is suggested all boaters look into these clubs. For the novice, they offer a chance to learn boating fundamentals. This includes everything from common sense afloat rules to the mechanical aspects of boat operation. Membership allows new and experienced boaters alike, the opportunity to meet new people with similar interests and to enjoy the sport together.

Most clubs hold monthly meetings where current business is discussed and entertainment, such as boating movies or guest speakers, is featured. Plans are laid for coming cruises and activities. Many people have found that club membership extends their boating through the entire year. Even if they cannot be on the water, they can be making plans and talking boating.

While some clubs prefer not to affiliate, most are associated with some national or state group. The Outboard Boating Club of America serves as the parent organization for many clubs. This national organization is helpful in getting clubs started and in providing them with much useful information on current events significant to boating. In addition to the OBC, as it is most often referred to, many clubs are members of state and regional boating associations.

If you do not now belong to a boating club, give it some thought. If none exists in your area, talk it over with some of your fellow boaters and get one started. The Outboard Boating Club of America has published a fine booklet entitled, "How To Organize For More Fun Afloat." It's full of ideas on starting a club and keeping it going. A free copy can be obtained by writing them at 307 North Michigan Avenue, Chicago 1, Ill.

Keep Motor Upright

If you own a small motor and remove it from the boat after each outing, Evinrude engineers suggest you hold it upright on the dock for a few moments so water will drain from the lower unit and not enter the cylinder and crankcase through the exhaust ports.

* * *

A tool kit containing pliers, screwdriver, wrench, drive pins, cotter pins, extra spark plugs and a spare propeller, should always be carried in an outboard rig.



JUST EASING ALONG . . . complete relaxation is the answer supplied by boats regardless of what kind, how big or small, to millions of Americans seeking relief from the common merry-go-round of daily life.

How's Your Boating I.Q.?

Now that the summer boating season has passed the midpoint it may be a good idea to spend a few minutes in reviewing your general boating knowledge. The true and false quiz appearing below covers many phases of boating. If you can answer all of the questions correctly, consider yourself somewhat of a nautical expert. If you miss two or more you could probably stand a little brushing up.

The United States Power Squadrons and the Coast Guard Auxiliary offer courses in seamanship from time to time. Seasoned, as well as novice boaters, should take advantage of them. In addition to these classes, you can learn more about boating by reading a few of the many excellent books written on the subject. Boating has grown fast in the last few years and there may be some new ideas you are not familiar with.

Give the quiz a try. A perfect score makes you an admiral; one wrong may still qualify you as a captain; if you miss two you're probably an able bodied seaman but three wrong washes you out and sends you back to boot camp for further training. Good luck!

1. Reversing the motor and accelerating briefly will usually free a propeller of weeds.

2. When docking a boat at a pier, approach into the wind or current.

3. Starboard refers to the left side of a boat when looking toward the bow.

4. Poor idling is often a sign of defective spark plugs.

5. When pulling two water skiers, one rope should be shorter than the other.

6. When a barometer falls rapidly, be alert for foul weather.

7. A safety chain is used to secure a boat to a trailer.

8. Marine growth, such as barnacles and scum, have little effect on boat speed.

9. You can be held responsible for damage caused by the wake thrown by your boat.

10. A boat leaving a dock has the right of way.

11. The skin diver's flag is red with a white diagonal stripe.

12. The water skiing flag is white with a red diagonal stripe flanked by a pair of red water skis.

13. Excessive vibration may be caused by a bent or broken propeller.

14. A bilge pump is used to inflate air mattresses.

15. A knot is a measure of speed rather than distance.

Answers: (1) True; (2) True; (3) False; (4) True; (5) False; (6) True; (7) False; (8) False; (9) True; (10) False; (11) True; (12) True; (13) True; (14) False; (15) True.

When boating at night, extra lights, entirely independent of your boat's electrical system, are handy to have.

Remember your "three R's" in boating. Red buoys mark the Right side of the channel Returning to the pier.



Boating Courtesy Includes Recognition of Diving Flag

A red and white flag bobbing near an empty boat has become a familiar scene on the waterways. It calls for an extra bit of caution on the part of boaters, for it indicates that a skin diver is operating in the area.

SCUBA diving, the name being taken from the first letters of self contained underwater breathing apparatus, is a comparatively new but fast growing water sport. It has generated much interest among water lovers as it offers an opportunity to discover a new world of underwater adventure. While not difficult to learn, SCUBA diving requires training under close and qualified supervision. It is not a sport to be hastily attempted by a novice without proper preparation. Because of its increasing popularity, training courses have been set up by various organizations throughout the country.

The demands of a skin diver are few. About all he asks is that you keep your distance when you see his flag. Boaters should stay at least 50 feet away from the flag which is a white diagonal stripe on a red field. The diver will try to come up near the flag but may at times be forced to surface elsewhere. Common sense and boating courtesy dictate that you allow him an extra margin of safety.

If you have the misfortune of losing equipment overboard, don't hesitate to call a nearby diver to the rescue. His fun is increased if he has some objective, such as a submerged fishing rod, to go after. He will probably be happy to retrieve it for you.

Cooperate with skin divers, as well as all boaters, by respecting their rights and giving them enough room to properly enjoy their particular activity. If you're not familiar with various water sports and activities, try to learn more about them. If you can appreciate the problems of fishermen, water skiers, skin divers and others, you will be able to be more considerate. The old saying that "courtesy is contagious" still holds true. Cooperate with others and you'll find they'll be happy to cooperate with you.

The Editor's Angle

We got a line from George Varzaly, Pittsburgh, Pa., who spent a week at Lake LeBoeuf, Erie County, with his family in July. While there, he saw Fred Kohler catch three muskies, two of which were 28- and 32-inchers, both released and returned. The third fish was 38 inches, weighed 13½ pounds. Kohler's buddy, Chet Exley, connected with 11 muskies from the lake last year.

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Another musky mention is a 36-incher, 10 pound fish landed by Earl Burwell of Dunkard, Pa. The fish was fin-marked, had been released in Conneaut Lake as a 9-inch fingerling in September 1956 by the Fish Commission.

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During the past years many ideas have been adopted and adapted from the Old World by Americans. Via a recent radio item, District Warden Paul Antolosky (Centre) was startled to come up against a reverse of this. Seems the old veteran gondoliers operating romantic cruises on the ancient canals of Venice are bitterly complaining of a new type of competition that threatens to put them all out of business (lovers rebel!). Only recently on the traditionally manpowered gondolas there have appeared attached thereto, of all things . . . outboard motors!

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Has the worm turned? The Robert Hunsingers, Senior and Junior, of Austin, Pa., figure it might be true . . . after Robert, Jr., caught an 18-inch brown trout in East Fork Creek recently. Dressing out the trout he found a baby mink in the stomach. Robert, Sr., former Pennsylvania Game Protector, always figured mink ate fish but certainly not vice versa!

#

Robert Boyer of Altoona has had his ups and downs! Bob, an avid boating fan, recently bought an "aqua-plane" for use on Raystown Dam. The contraption resembles a helicopter with large rotary blades on top, a platform with seat and control stick all mounted on pontoons. Idea is to tow it behind a motor boat so it can soar to an estimated 100 feet. On maiden flight with Bob at the stick, something failed to orbit. Pilot badly shaken up, contraption all busted up. Extensive repairs have now been made, pre-flight inspections carefully made, everything is again ready for blast-off . . . if and when somebody'll volunteer for the engine room detail.

#

July angling was good in Bedford County . . . reports District Warden Wm. McIlnay (Bedford). George A. Martz, Cumberland, Md., took his 55th largemouthed bass from Gordon Lake, many 12 to 16 inches. Roy Grain, also of Cumberland, caught some fine bass from both Koon and Gordon Lakes. An angler by the name of Howler, caught a 15-inch rainbow trout at Gordon Lake. While landing the fish something up and mangled the daylight out of it. Warden McIlnay suggests it was a big musky.

Clyde and Don Kyle, fishing Conneaut Lake in late July, saw a school of white bass feeding. Using a small spinning lure Don caught four of these fish before they left the vicinity. Dressed, the fish weighed over a pound. In the four stomachs were 84 small perch up to 1½ inches long.

#

Special Fish Warden Herman Wiedenheft reports the muskellunge catch in Edinboro Lake (Erie) is approaching 100 fish thus far in 1961. Majority have run between 26 and 28 inches, all released and returned. This makes the Edinboro boys happy, looking forward to next year!

#

Quite often a lure or bait that went out of style years ago suddenly makes a come back. Such is the case on the Allegheny River. Recently, a Jamestown, N. Y., angler banged into some nice muskies on a Slim Jim, a bait made years ago, now discontinued. While nothing new to old timers, you can bet that some of the old dusty manuscripts will now be rooted out in old established tackle stores!

#

Warden Ken Corey (Warren) reports Ralph Birkhimer, Johnstown, Pa., rassed a 33-inch, 16-pound channel catfish to a successful conclusion from the Allegheny River near Tidioute recently.

#

Game Protector Theodore Vesloski (Greene) stopped along Ten Mile Creek this summer to check a fisherman just finished seining for crayfish. While the contents of his minnow pail was counted, the angler removed a straw hat he was wearing. On his baldpate, shiny and glittery as a billiard ball, were five more crayfish. Why? Well, going over the legal limit wasn't the answer because he had exactly 35 "crawdads" on the nose, including the five on the noggin. New hair-restorer maybe?

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Even in the contemplative sport of fishing, "LUCK" is preparation meeting opportunity.

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Ever get tired fishing the same holes, the same streams? Best bet in a search for new angling spots is to write the Fish Commission, Harrisburg, Pa., for a free copy of the booklet "Fishing Waters In Pennsylvania." It describes all lakes, ponds and streams throughout the Commonwealth, the species of fish found therein.

#

Many a camper is puzzled as to how the Arab folded his tent and silently. . . .

#

From New York harbor some 30,000,000 cubic yards of trash are taken each year, including everything from grand pianos to a dead giraffe.

Susquehanna Federation Field Day Sept. 24 at Harford Fairgrounds

The annual Field Day of Susquehanna County Federation of Sportsmen Clubs is scheduled for September 24 at Harford (Pa.) Fairgrounds, events starting at 10 a.m. Rain date is October 1.

Trapshooting, coon chase, horse show, rides, archery and Mo-Skeet, turkey shoot and exhibition shooting plus the always interesting Fish Commission exhibit will feature the event. Robert DeLuca is Federation president.

Harrisburg Optimists Again Sponsor Angling Youngsters at Italian Lake

More than 500 youngsters below fishing license age have registered in the annual Fishing Festival for kids at Harrisburg's Italian Lake. The affair is again sponsored by Harrisburg Optimist Club and headed by Club President, Walter Ramsey, and Boys Work Chairman, Robert Fisher. This year the project opened August 5 and will conclude with the opening of Harrisburg and vicinity public schools. Photographs by O. A. Smith, Jr.



OPENING DAY at Italian Lake Fishing Project sponsored by Harrisburg Optimist Club. Barbara Jean Smith gets badge from Mrs. Janet Haines, Registrar.



KENNETH FARNES, Harrisburg, landed biggest fish August 8, a 23½-inch catfish.

BARBARA KITNER, age 6, Harrisburg, shows her dolly all the fishing tricks.

TOP ANGLERS IN HARRISBURG HUNTERS-ANGLERS CONTEST



AWARD WINNERS in 1960 Big Fish Contest sponsored by Harrisburg Hunters and Anglers Association: Seated (l-r), Guy Ridge, William N. Norman, Charles Hummer, Evelyn Ranck, Edward Breach and Ruchard Charles. Standing (l-r), David Casey, Claud Van Scoik, Grant Hitz, Ronald Sultzaburger, Bruce Wright, Edward Crumlich, Charles G. Greider, Jack Shambaugh and Emil Kanyuck. Howard T. Kepner, who caught a 29-inch rainbow, the second largest entered in the 23-year history of the contest, was not present when photo was taken.



BILL LUNDBERG, Harrisburg, had smallest catch of the day —4-inch sunfish.



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Odd Rock—on the Cover



Standing Stone near Towanda, Bradford County, is one of the most strange, historic rock formations found in the 400-mile stretch of the Susquehanna River.

The stone first gained notoriety in the 18th Century when settlers, fleeing the revolution in France, came to Pennsylvania to seek an asylum for Marie Antoinette. Voyaging into the interior the settlers purchased 2,400 acres, measured from this huge standing stone landmark, built a village at the next downstream bend. The huge stone, probably up ended by a glacier, became a natural cornerpost for this early French settlement in 1893. The town, of course, never materialized. The Queen was beheaded.

The stone stands on the shore of the river, as though it were a monument to the frivolous French Queen and her loyal settlers. Countless fishermen float past the big stone each summer and many sizable small-mouthed bass are caught within the shadows of this landmark.

Don Shiner



The Queen's Rock

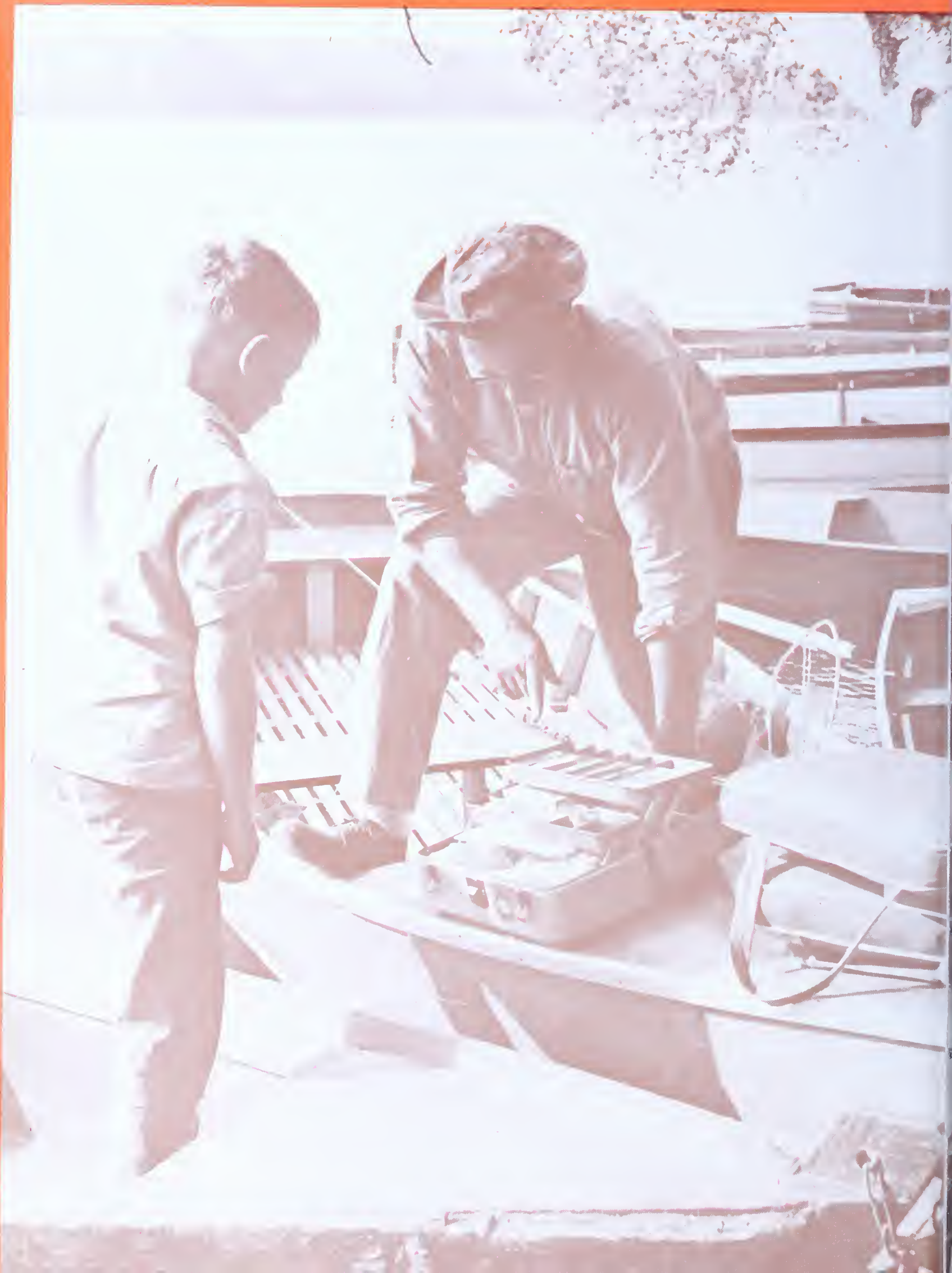




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Pennsylvania
Angler

October 1961



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OCTOBER, 1961



VOL. 30, NO. 10

GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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There's More Than One Way

By KEEN BUSS

Fishery Biologist
Benner Spring Fish Research Station
Pennsylvania Fish Commission

Pennsylvania Fish Commission Photos by Johnny Nicklas

FOR generations, scientists and fishermen have been striving to find a better method of marking aquatic life. The biologist is interested in marked animals because it aids him to determine movement, age and growth, population densities and other habits pertaining to individuals. The fisherman marks fish, perhaps for similar reasons, but it also adds to his enjoyment to know that a particular fish which he has caught has lived to be captured again; or perhaps his thrills are enhanced to know that he has outfoxed some wily *denizen* of the water time and again. Whatever the purpose, a mark on a specific animal makes a special individual out of many from which something can be learned or some added pleasure derived.

The oldest method of marking is probably cutting an edge off a fin or punching a hole in a fin. This is not enough, because fins, like fingernails, continue to grow and the mark is soon lost. When fins are cut back to the meaty portion or butt so that there is a slight show of blood, there is little chance for complete regrowth. If the fin does regenerate, it is usually crippled in some manner.

Mechanical tags are also used to mark fish. Metal jaw tags, plastic buttons and plastic streamer tags are often used. These leave something to be desired since they may interfere with breathing, eating, set up an infection, stunt the growth, serve as an attraction for predators or they may get lost.

One of the better methods to mark groups of fish under seven inches in length is to pull the fin with a small pair of jeweler pliers. By grasping the fin close to the base and pulling with a slight twist, the fin plus the "root" can be taken out. The wound heals over

with no evidence of the fin having been present. Figure 2.

Probably a more spectacular manner of marking animals is by branding. This is a simple and quick way to mark fish. The brands can be made by using the wire taken from the heating element of an old electric stove and shaping it into the desired numeral or letter. After this, the numeral is heated white hot, either by electricity or flame, and it is rolled on the dorsal surface of the anesthetized fish. It is necessary to apply the brand on the top or dorsal portion of the fish in order that the black pigment will develop. Trout branded on the sides and belly surface do not develop a black pigmentation and it is difficult and sometimes impossible to see the brand. When brook trout are branded, the ensuing mark is made up of solid black pigment while a brand on rainbow trout is made up of black spots. Brands made up of spots are often lost in the natural markings (See Figures 5 and 6). Brands on brown trout have been erratic in the formation. Some branded brown trout develop legible marks; other brands fail to develop in a discernible manner in this species. These brands often heal in the form of spots rather than solid black pigment.

Although the wound from the brand often looks raw and it appears that the fish will die, fish seldom suffer any impairments after four to six weeks.

At the Benner Spring Fish Research Station branding is used primarily on brook trout to identify individuals. The first number is the strain and the second is the individual number. These brands make it possible to check individual experimental fish without seining all the fish. The number on the fish can easily be seen in the pond.



Give a MARK on Life



Fig. 1. **FIN CLIPPING**—one of the simplest methods of marking groups of fish. Fin should be clipped close enough to draw a spot of blood.

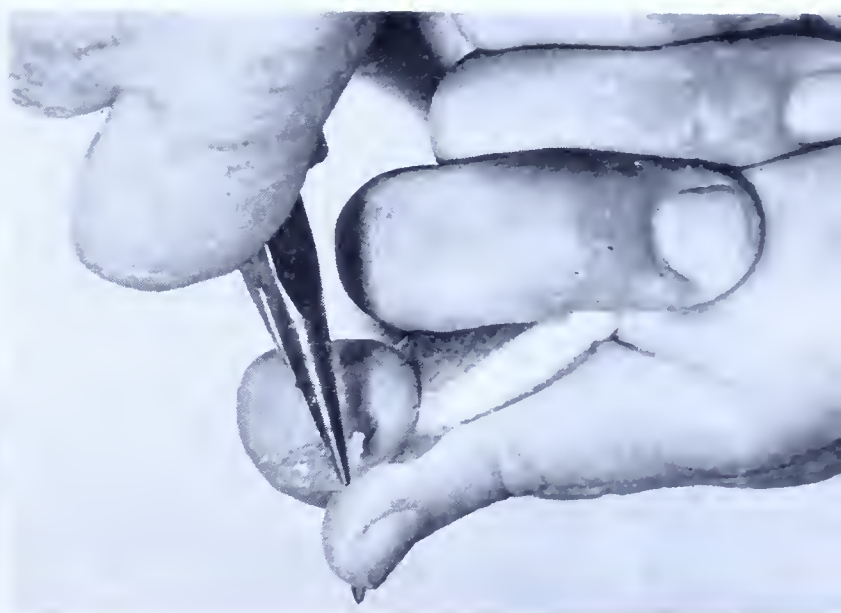


Fig. 2. **FIN PULLING**. When fin is pulled correctly the "root" is removed as shown on fin in pliers.

Fig. 3. **EXPERIMENTAL BRANDING** apparatus designed with the cooperation of the Pennsylvania State University.



Fig. 4. **APPLYING** the hot brand to the dorsal surface of a brook trout.





FIG. 5. HEALED BRAND on rainbow trout is composed of black spots.

Other species have been marked successfully. A wall-eye branded in the fall still had a visible, apparently permanent mark in the spring. However, this mark was noticeable not because of black pigmentation but because of the lack of scales (Figure 7). The scale "pockets" had been permanently damaged and no scales could develop.

Frogs, too, lend themselves to the branding technique. Frog shown in Figure 8 was branded for over a year.

Not all attempts to brand were successful. Bullheads

and suckers failed to develop legible marks.

This branding technique has been used recently to mark splake (brook trout-lake trout cross) in a Great Lakes study. It has also been adopted in Israel to mark carp for selective breeding purposes. Strangely enough, mirror carp (scaleless carp) when branded, develop scales in the area of the brand and are easily seen. This has facilitated the selective breeding program in this new country. Obviously, the original branding work at Benner Spring has left *its* mark on life.

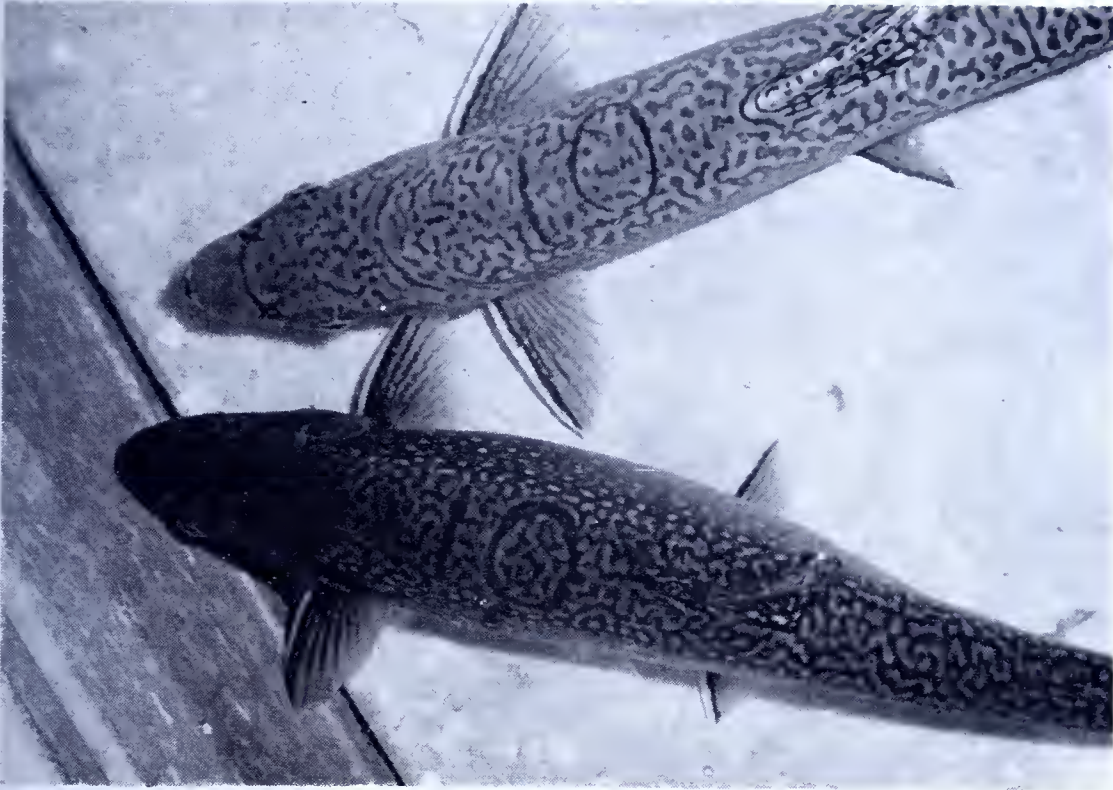


Fig. 6. HEALED BRAND on brook trout is solid black pigmented scar.

Fig. 7. BRAND ON WALLEYE is not pigmented but scales are destroyed.

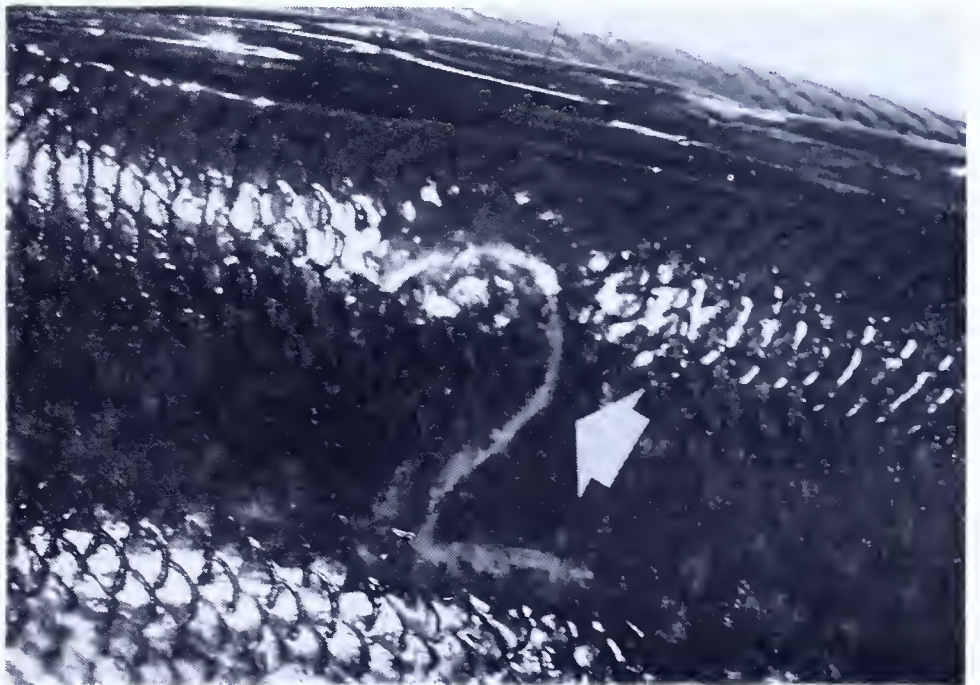


Fig. 8. EVEN FROGS lend themselves to the branding.

RECORD NORTHERN PIKE—

Fact and Fiction

By KEEN BUSS

Benner Spring Fish Research Station
Pennsylvania Fish Commission

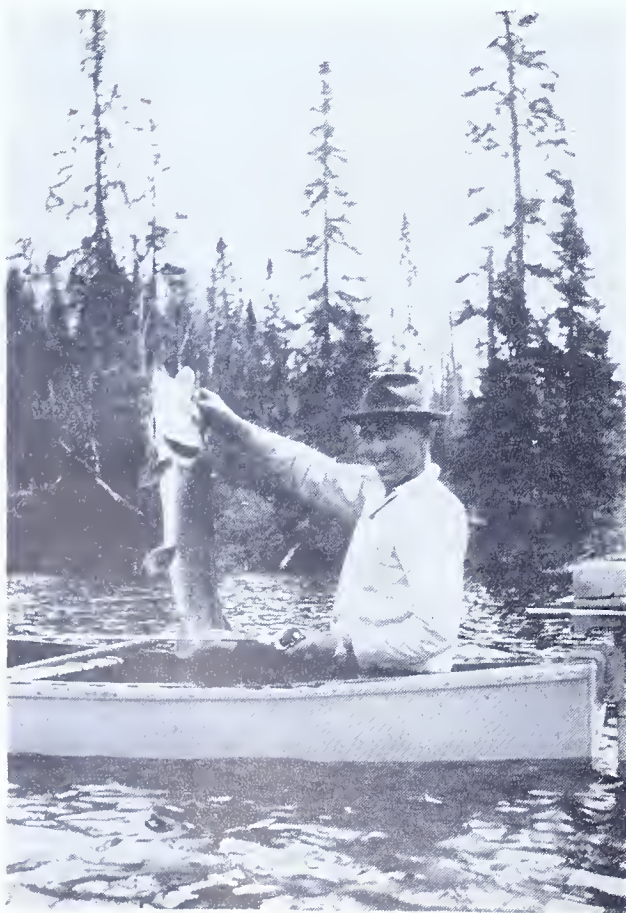


Fig. No. 1—Not a record, but this northern pike was large enough to make fishing interesting.

IT IS impossible to discuss record northern pike without first mentioning the "Emperor's Pike." This story, first told by Gesner in 1558, concerns a pike captured in a lake in Württemberg in 1497. This fish was a monster of its species weighing 550 pounds and stretching out to 19 feet. To thicken the plot, this pike had an inscribed copper ring encircling the gill region. The inscription indicated that the pike had been planted in this lake by Emperor Frederick II in the year 1230—267 years before. Do you suppose old Frederick belonged to any of the fish taggers' associations?

There are two things wrong with this story besides the fact that it is utterly ridiculous. First, according to the normal length-weight ratios found in "modern" pike, a 19-foot pike would weigh about 3,000 pounds. Secondly, the skeleton which is preserved in the Cathedral in Mannheim was found to have too many vertebrae for a pike. Obviously fishermen have changed little through the centuries except in their manner of stretching their fish.

The Emperor's pike did have repercussions in Europe. In 1759, a Swedish clergyman, Hans Hederstorn, doubted this story. "Why," he reasoned, "should a pike after living 70 or 80 years, according to ancient belief, still enjoy the springtime of life, while even man is already wasted?"

He continued, "I do not deny that there exist many things in the mineral and plant kingdom which surpass man with regard to age. An oak, and other trees can reach an age of 4 to 5 generations. But let us cast a

look upon the Creator's wise laws in Nature. What is intended to last a long time, has to be accomplished slowly. What grows more slowly than the rock, what is more lasting? What develops more quickly than a fungus, but what is at the same time more perishable? The greater and stronger trees are intended to be used by man for the construction of houses which shall stand against time, or ships which shall withstand the impetuosity of the waves. For this aim, slow growth and strong resistance are required. But why should fish, which after all can never serve any other purpose than that of providing a meal, grow for 200 or 300 years?"

Hederstrom did not stop with just reasoning. He began to explore the possibility of aging fish. He noted that the vertebrae had concentric rings and the larger fish had more rings than the smaller ones. With this observation, he examined many of the fish species indigenous to Sweden. He established average growth rates which were the same as present day findings in that country.

The Emperor's pike tale which was no doubt started as a farce, eventually was responsible for arousing the curiosity which laid the groundwork for our "modern" fishery science—although that was 201 years ago.

There are some references in the literature of monstrous pike taken before the twentieth century. Some of these pike may have grown with the telling. Some of them may have resulted from guess estimates. It is even possible that some are facts, but there is always room for doubt.

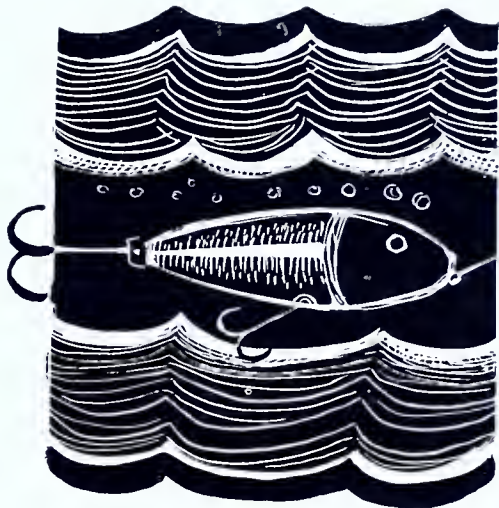
The supposedly record European pike was said to be a fish taken in Bergenty in 1862. This pike was supposed to have weighed 145 pounds. Another pike taken in Scotland, no date, was said to have been 7 feet long and weighed 72 pounds. The largest pike reported from the American continent was taken in Lake Tschotagama in the St. John's drainage in 1890. This fish was reputed to weigh 49 pounds.

Pickering in his PISCATORIAL REMINISCENCES speaks of a pike taken in Lock Spey that weighed 146 pounds. DODSLEY'S REGISTER (England) in 1765 reported that "In emptying a pool which had not been fished for ages, at Lilleshaw Lime Works near Newport, an enormous pike was found weighing 175 pounds."

The Scandinavian record, reported as authentic, was taken in 1892. This fish weighed 57.2 pounds.

The pike of Europe even though they are the same species as North American northern pike are said to grow larger, probably because of the large fish recorded in the old writings. We were curious about the modern records, so we wrote to "Omar" (O. M. Reed) author of the SPECIMEN PIKE articles which appear in the British FISHING GAZETTE. We are indebted to him for the information on the records of pike of the British Isles.

The pike, considered by some as the modern world's record, was a 53-pound fish taken at Lough Conn, Ireland, in 1920. Strangely enough, although it was taken on a 2½-inch copper and silver spoon, it had in its



stomach a salmon 30 inches long. Apparently no morsel was too large or too small for this monster which measured 51 inches and was 36 inches in girth. It took about 3 hours to land this fish and he still persists in part, for his skull is preserved in the British Museum in London.

The record Scottish pike weighed 47 pounds, 11 ounces, and was taken on live bait from Loch Lomond in July, 1945. Could this have been one of the famous Scotland "sea-monsters" sighted about this time?

Other records from the British Isles are England, 49 inches, 37½ pounds, and Wales, 46 inches, 37 pounds.

With the exception of the world's record Irish pike, the modern British Isles pike seem to be about the same size as their North American counterpart.

In the table below are shown the record North American northern pike compiled by Field and Stream Magazine from the Field and Stream Annual Fishing Contest. It is through their courtesy that these records are published.

Weight	Length	Date	Where Caught
46 lbs., 2 oz.—	52½"	—9/15/40—	Sacandaga Reservoir, New York
45 lbs., 12 oz.—	49"	—5/16/29—	Basswood Lake, Minnesota
42 lbs., 12 oz.—	43"	—7/19/54—	Lake Athabaska, Saskatchewan
42 lbs., 2 oz.—	48"	—6/24/46—	Delancy Lake, Ontario
42 lbs., 2 oz.—	48"	—9/ 3/59—	Sioux Lookout, Ontario

Large fish, but not necessarily record fish, on file for other states and provinces are Quebec—38.8 pounds, Wisconsin—38.0 pounds, Michigan—33.8 pounds, Alberta—32.0 pounds, Manitoba—30.2 pounds and North Dakota (state record)—26.8 pounds. Conspicuous by its absence is a record for large northern pike in Pennsylvania. Anybody know of any big ones that can be authenticated—fact not fiction?



ROCK BASS is known popularly as "redeye" or "goggleeye," seems forever hungry, will attack lures no matter how large.

The Age and Growth of the

ROCK BASS

in Pennsylvania

PART XI

By

JACK MILLER and KEEN BUSS

Fishery Biologists

Benner Spring Fish Research Station

Pennsylvania Fish Commission

The rock bass, sometimes called "redeye" or "goggle-eye" is a voracious feeder. These fish will tackle a lure as large or larger than themselves or inhale a popping bug large enough to plug their mouth. These surface baits are taken with gusto with a characteristic "slurping," sucking noise that, once identified by the fisherman, cannot be mistaken. This forever hungry sunfish can be found in the same rocky areas as smallmouth

bass and its food is similar. Insects, small crustaceans and small fishes are favorite items of diet. Since its habits and habitat are so similar to the smallmouth bass, many are incidentally or accidentally taken by bass fishermen.

The rock bass spawns, as do many of the other sunfishes, by excavating a nest in the sand or gravel. A female of this prolific species may average from 3,000

to 5,000 eggs but exceptionally large females have been known to lay up to 11,000 eggs. This fish will thrive in both lakes and rivers but usually the largest populations are found in rivers. Five to eight inch rock bass are most commonly caught. Fish over ten inches are rare but occasionally one is taken that will be over a pound in weight. In the following table the length-weight relationship is illustrated.

TABLE I
Length-Weight Relationship of
117 Rock Bass from Pennsylvania Waters

<i>Length in Inches</i>	<i>Number of Fish</i>	<i>Average Weight in Pounds</i>
3.0-3.9	3	.05
4.0-4.9	14	.08
5.0-5.9	21	.11
6.0-6.9	26	.21
7.0-7.9	33	.29
8.0-8.9	16	.42
9.0-9.9	4	.67

The growth of rock bass, like other fishes, varies with the fertility of the water and with the amount of competition from other rock bass and other species. Relatively infertile lakes such as Fairview Lake in Pike County and Card Pond in Susquehanna County have much slower growth than the more productive Lake Clarke on the lower Susquehanna River (see Table II). The average for the seven water areas shown in Table II includes the growth from some unproductive waters. This average, of course, does not mean the maximum growth of this species.

The rock bass is not the fastest growing of the sun-fish family, but it supplies many of the incidental catches between game fish. Don't sneer at his impertinence for taking your bass bait, he may change an otherwise dull day into an interesting fishing trip.



HARD HITTING ROCK BASS, such as this 9½-inch specimen from the North Branch, Susquehanna River, provide excellent sport on light tackle.

TABLE II
Average Calculated Total Lengths of Rock Bass at Each Annulus in Pennsylvania Waters

<i>Water</i>	<i>County</i>	<i>Number</i>	<i>Year Class</i>						
			<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>
Wrighter's Lake	Wayne and Susquehanna	25	1.0	2.7	5.1	6.6	8.4	9.1	
Card Pond	Susquehanna	11	1.2	3.5	4.6				
Lake Clarke	York	16	1.6	4.6	7.3	9.0	9.6	9.8	
Quaker Lake	Susquehanna	44	1.0	3.0	5.7	7.0	7.5	8.3	9.0
Little Pine Creek Dam	Lycoming	13	1.4	3.2	4.6	5.6	6.4	7.1	
Fairview Lake	Pike	6	0.9	2.1	3.9	5.9			
Delaware River		37	1.4	3.7	5.7	7.2	8.5		
Average for Water Areas			1.2	3.3	5.3	6.9	8.1	8.6	9.0



DO FISH SLEEP?

By David Gunston

It is commonly assumed by many people, some anglers among them, that fish do not sleep. Of course, it is not difficult to see how such an odd belief arose. In the dim, unscientific past, people looked at fish, saw no ears and therefore assumed fish could not hear. Similarly, when they saw that fish had no eyelids so that their eyes could not be closed like our own, and those of birds and animals, they not unnaturally assumed that fish did not sleep, either.

Certainly, some observations of more recent origin have tended to support this view. Fish watched in tanks and aquariums appeared to go without sleep. A gray nurse shark in an aquarium in Sydney, Australia, is said to have kept on the move—apparently without sleep—for six years, swimming over 200,000 miles in the process. Watch kept on small captive whales in Florida marine aquarium have also tended to support the view that sleep is unknown in the fish world.

The truth is, nevertheless, that all fish do sleep, at least for some part of their lives. Their concept of "a good night's sleep" may not tally with our own, for perhaps only a few minutes' respite will enable them to keep going for another twenty-four hours. Some fish sleep much more than others, and the habit varies not only amongst different species, but also in changes of environment, water temperature and the length of the hours of daylight.

If some fish manage with what seems to us the very

minimum of sleep, others like several hours' motionless rest, usually on the bottom. The mere fact of eyes closing or not closing has nothing to do with it. Human beings may close their eyes for sleep, but they have no ways of shutting their ears, and they manage to sleep soundly through all the hubbub of a big modern city with a large volume of noise still impinging upon their eardrums. Similarly, fish may be sound asleep, unseeing and unhearing, though their eyes still present to us on the outside the normal glazed, seeing appearance. Whatever we are, whether people or elephants or birds or fish, when we sleep our minds are temporarily withdrawn from the outside world.

Although a fish's eye is fundamentally very similar to our own but lacking true eyelids, this is simply because whereas we need lids constantly to moisten and clean the surface of our eyeballs in contact with the dirt and dust of the air, a fish has its eyes naturally and constantly lubricated by the water in which it swims. This is vividly illustrated by the case of the four-eyed fish *Anableps*, which lives in Central America. Possessing eyes divided into two sections, one for seeing under water and one for seeing in the air, it lies habitually on the surface for hours on end with the upper half of each eye clear of the water. But this exposed portion of the eyes, although adapted for vision out of water, has no eyelid arrangement, so the poor fish has to keep ducking its head beneath the water every few minutes in

order to freshen up the exposed section of its eyes!

The time is a long way off yet when science knows all the answers to the mystery of sleep, but we do know it is a nervous, rather than just a physical phenomenon. The ancient view that sleep came when the accumulation of fatigue products in the blood stream reached a certain level has long been discounted, partly from observations of Siamese twins. These inevitably share a common blood system, yet one can sleep while the other remains wide awake. So whilst fish sleep, may for short periods, be as deep and complete as terrestrial animal sleep, it is rarely enjoyed for very long periods without a break. The need for immediate sleep can swiftly be overridden by external factors more readily than in the human world. Fish which prefer to sleep in total darkness will go on swimming if they are still hungry. Sea trout and others, dozing perhaps after dusk, will become active as the moon rises and feed happily in the moonlight. Sleeping gray mullet have been known to be immediately woken by artificial light, to re-form their shoals and swim on as if nothing had happened.

While the majority of fish probably sleep resting on or close to the bottom, some will take up a somnolent posture suspended in the water. Flatfish and one or two other species with unorthodox habits regularly sleep on their sides on the bottom, often deep in mud or sand. Lampreys attach themselves to a stone when wanting to sleep in a swift current. The general, but by no means invariable rule seems to be that inland and coastal fish prefer the bottom as a bed, whilst open sea and the larger oceanic fish usually sleep suspended in mid-water. A few fish, like the basking shark, and the opah or moon-fish, sleep on the surface. Basking sharks lie with the dorsal fin and part of the back above water, and sometimes they will doze side or even belly uppermost. There is no doubt that for much of the time they spend basking in the sun, they are enjoying sleep.

Unorthodox sleeping positions are the exception rather than the rule with fish, and do not include the variety found in the terrestrial animal and human worlds. Trigger fish like to sleep head downwards, and most of the wrasses prefer to turn on their sides. One small Bermuda wrasse, known as the "Slippery Dick," can be said to pull the covers over its head when going to sleep. It dives slantingly into the soft sand on the bottom, gives a few powerful wriggles with its tail, and immediately disappears from view. Even in a tank it is hard to detect the little volcanic peak of sand, gently rising and falling as the fish breathes, which marks the spot where its gill-openings lie hidden. It can be induced to perform this act if placed in a darkened room even in daytime.

Oddly enough, sudden light or noise, or the pangs of hunger may wake a sleeping fish faster than touching it. Many a soundly sleeping fish in an aquarium can be gently prodded without waking it. There seems some evidence, too, that the practice of tickling trout may include the simple factor that the fish caught so readily and amazingly may be simply sound asleep!

The CLUTTER-CLOUDS ARE AT IT AGAIN!



Litter—A National Problem

Despite the efforts—and accomplishments—of civic and service organizations, private citizens, government agencies and many other groups, the volume of litter throughout the United States has increased steadily during recent years. A major factor in the overall problem is—

Many Americans feel no personal responsibility for the appearance of public property. They have no sense of guilt when dropping litter on city streets, highways, beaches, parks or any other recreational area. The majority of the trash-tossing public has no idea of the staggering amount of litter that accumulates or the cost and effort required to remove it.

Inadequate collection and disposal equipment to meet the needs of an ever-growing population, an expanding highway system, a shorter work-week, increased facilities for outdoor recreation—all of which provide greater opportunities for the "littering" public than ever before.

The following facts indicate the extent and the seriousness of this situation:

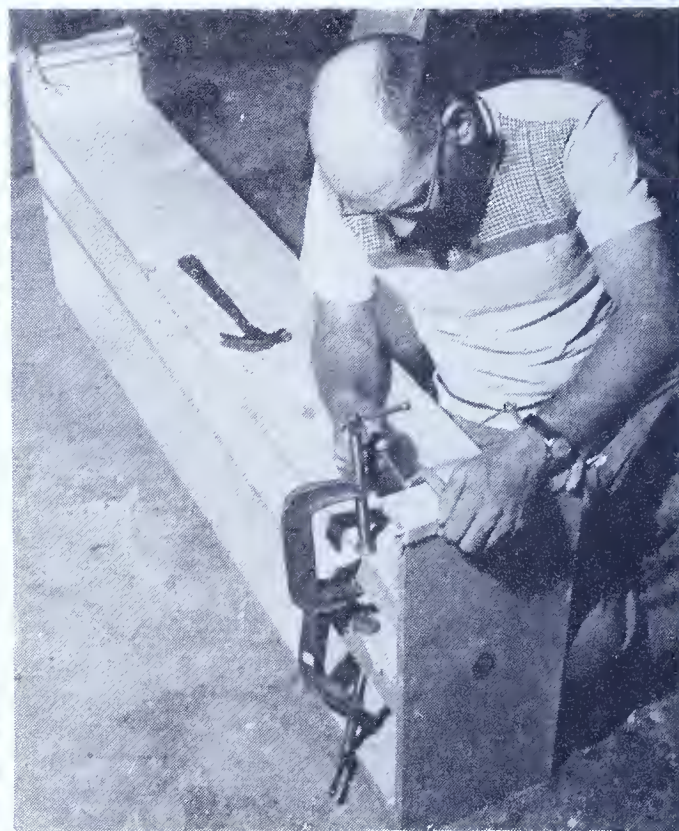
1. Close to 800 Americans are killed and nearly 75,000 seriously injured as a result of cars striking or swerving to avoid litter on highways.
2. More than 50 million dollars is spent annually to clean primary highways alone—in addition to the countless millions allocated for litter removal from city streets, public buildings, beaches, parks, other recreational spots and the countryside itself.
3. Accumulations of rubbish and litter were responsible for over 57,000 building fires—representing a loss of more than \$22 million—in just one year.
4. Litter is a health menace; it creates a breeding ground for disease-carrying insects and rodents. Littered waters make it dangerous to swim or fish in some recreational areas.
5. The U. S. Forest Service annually budgets \$2 million for sanitation and removal of litter from national forests.

Build This WINDOW SEAT

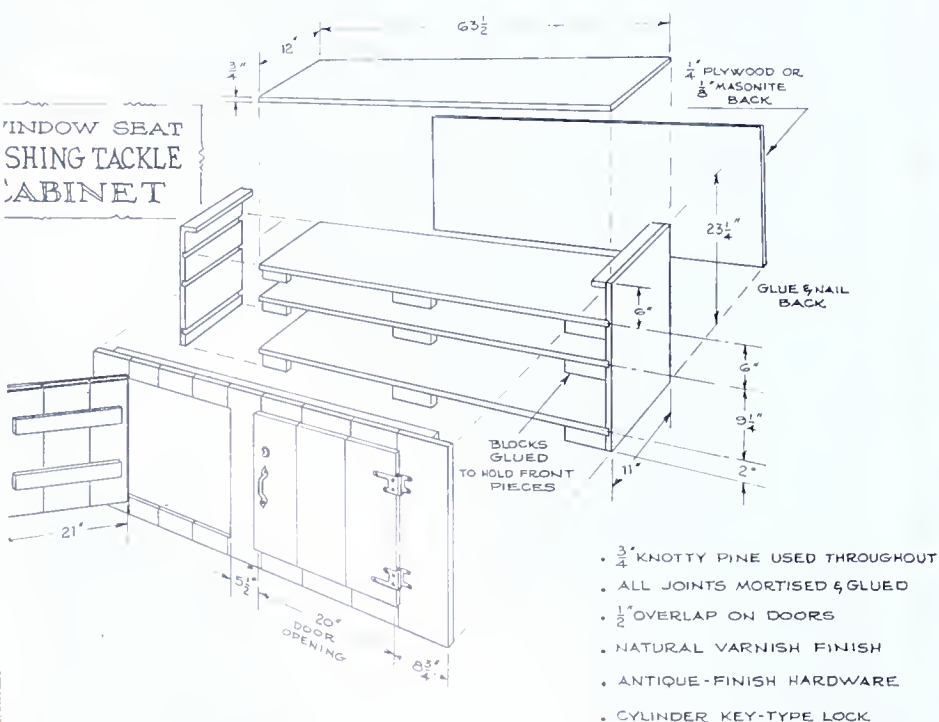
Fishing Tackle Cabinet



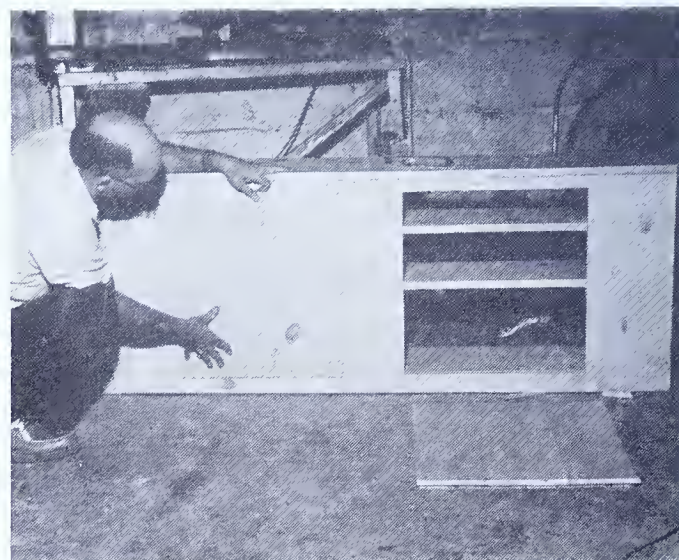
FISHING TACKLE CABINET fitted beneath a window serves as window seat plus ample space for angler's tackle.



1—START JOB by cutting side boards and mortising or slotting sides for shelving. Use good quality wood glue throughout.



PLANS, SPECIFICATIONS; dimensions can be altered to fit individual requirements and space.



5—MAKE DOORS a loose fit to allow easy closing. Select lumber with numerous knots for design to doors.

By DON SHINER



3—WOOD STRIP behind front door spacer, near corners, anchors down top of cabinet.



4—DOORS are made by gluing, joining several boards together. Apply glue to edges, then clamp boards tightly together, let dry.

4—K shelves in place. Be sure square. Blocks are glued, edges of shelves. Wood put out these blocks to hold



WOOD or masonite back completion of work on



7—CABINET IS SANDED to give glass-like, satin finish.



8—FINISHED CABINET. Finish as desired. Add a stain or give coating of white shell followed by 2 or 3 thin coats of varnish. Sand with fine sandpaper between coats.

We Asked the Women:

(wives of Pennsylvania outdoor writers)

"Do You Believe All Your Husband Writes, Talks About?"

From—Mrs. Harry Allaman

Mr. Allaman is M. C. of "*Call of the Outdoors*," WGAL TV.

The answer to your question is . . . YES! Now . . . if that makes him sound very dull and uninteresting, I assure you . . . life around these diggings can be quite exciting at times. The excitement is caused by our various boarders; and you never quite know from week to week who or what might pop up or pop in.

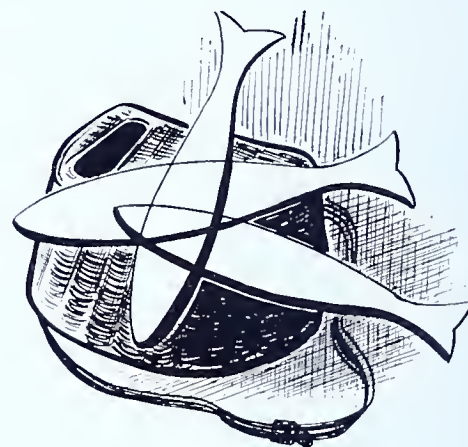
It all started years and years ago when Mr. Allaman came home one night, woke me out of a sound sleep with . . . "You'll never guess what I have!" Never too good at guessing games, just wanting to sleep, I reluctantly asked what it was. He dumped 8 or 9 live snakes on my bed. I was wide awake!

These snakes were non-poisonous, but they were followed by rattlers, coral snakes, water moccasins and copperheads. If they weren't from around this area, he'd import them. After a spell I became used to them, for most were quiet, docile boarders with simple appetites. A live mouse every 2 to 3 weeks sees them through the winter months. Some even hibernate and fresh water is everything necessary to keep them alive and happy.

Where did we get the live mice? We raised them! If you start with a male and 2 females, in a couple of months you have a hundred. Have you ever smelled just ONE mouse? No? They all stink! It got so odoriferous around here that I issued a "proclamation" followed by an "ultimatum" . . . EITHER ME OR THE MICE (in that order). It took six months before we found a spot for the "meeces"—the Hershey Zoo!

It wasn't a complete victory because our biggest mouse eater "Fuzzie Ozzie," our great horned owl, found his cage door open and took off. Lately we have two praying mantis living in the den window. Presently we operate with our regulars: dog, cat, parakeet, rabbit, ONE pet mouse, flying squirrels and assorted snakes.

We are genuinely fond of our friends, especially Harry, who studies them on his TV programs. So, sir, . . . yes, I believe Mr. Allaman.



From—Mrs. Hal Harrison

Mr. Harrison is outdoor editor, Pittsburgh *Post-Gazette*; his writings, fine photography, nationally known. Mr. Harrison's son, George, is Editor of the Pennsylvania Game News.

What surprises me about your question is the fact that you anticipate more than one answer. Why, of course I believe what my husband writes. But, what is more important, so do the newspapers and magazines that publish what he writes. Most of Hal's writings are factual and documentary. If they were not correct, he would have been looking for other work long ago.

There are times, of course, when he writes editorially in his column "Life Afield" in the Pittsburgh *Post-Gazette*. Some of these columns are controversial and call for an opinion. In these matters I do not feel justified in judging his work. Since I do not have the background necessary to form definite opinions in many things dealing with conservation, I must accept what he writes with blind faith.

I am aware of one very important thing, however. People who are important in the conservation world, people who are highly respected for their opinions, usually feel the same way about such matters. Many times he does not approve of something, says so, then is bitterly attacked for advancing or defending the truth as he sees it.

So . . . you see, I never have had any reason to disbelieve what my husband writes. There is no choice. I believe!

From—Mrs. Larry Stotz

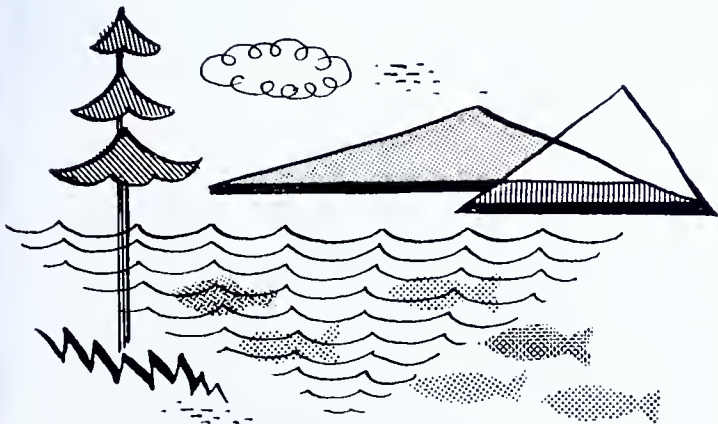
Mr. Stotz writes “Your Forest Ranger” for newspapers, magazines, articles in Game News, PENNSYLVANIA ANGLER, Pennsylvania Forests, many others.

Of course I believe all my husband writes and tells me. He is a man who likes to talk. During 26 years of married life, I have heard him do lots of talking! I have listened to many of his stories more than once, as most wives must. And, this is a good way to check on details, and I have to admit that he sticks to the same facts very closely. It may be that from his German ancestry he has inherited an ingrained respect for thoroughness and exactness of detail.

I couldn't be honest without giving him this salute. Many hours of research precede any writing or speaking he does. Every word, each fact, each figure is checked and rechecked for accuracy. To top it off, he writes and re-writes for polish. The truth is, his favorite nightmare is to dream he has exaggerated, falsified, or fumbled a fact. So I am compelled to believe what he talks and writes about.

Another reason why I am compelled to believe that he is telling the truth is that he has no opportunity to do otherwise. He has had both good and bad fortune, depending upon how you look at it, of living in a predominantly female household. Besides a determined wife, he has a teen-aged daughter, and an elderly but snappy female dog that will stand for no nonsense. The only masculine support he has is derived from a senile male dog inappropriately named “King” and a cat called Neuter.

His female constituents have set themselves up as his critics and censors. My experience as a schoolteacher, who for some years was accustomed to cope with the unusual ideas and punctuations of teen-agers, has made him and his works pretty easy game for my editing and punctuating. Between his teen-aged paragon and me, not a word, not a line escapes our vigilance. No statement emerging from behind the Iron Curtain could undergo more careful scrutiny than that to which his are subjected. So—why shouldn't I believe all my husband writes and tells me about?



Industrial Water Top
Fish Killer in U. S.

More fish are reported killed by industrial wastes than by other pollutants, according to a report of the Public Health Service's Division of Water Supply and Pollution Control.

Figures contained in the first summary report of the cooperative Federal-State fish-kill project showed that in the seven fishing months since beginning of the reporting system by the states, in June, 1960, a total of 286 reports has been received from 36 states showing a total of 6,300,000 fish killed.

Agricultural poisons accounted for the second highest number of fish-kill reports, though they were in fifth place in total number of fish killed.

The total river mileage affected was 1,153 miles, in addition to 51 miles of lake and bay shore lines and 1,407 acres of lakes, reservoirs and bays.

Of the 305 reports on source of kills (many reported more than one source) industrial wastes were reported in 98 instances, with a total of 5,460,000 fish killed; agricultural poisons were reported in 81 instances, with a total of 73,000 fish killed; unknown sources were reported 51 times with a total of 190,000 fish killed; “other” sources were listed in 38 reports with a total of 38,000 fish killed; domestic sewage was fifth with 27 reports, with 287,000 fish killed; and mining operations were reported 10 times with a total of 250,000 fish killed.

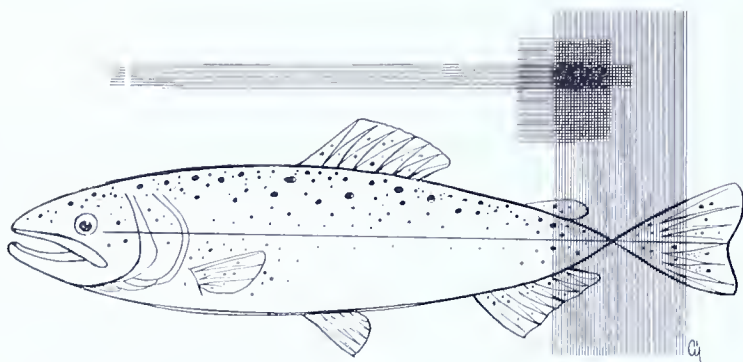
One kill traced to industrial wastes was estimated at 5,000,000. This was in 19 miles of the Kanawha River for about two days late in August, 1960, caused by a spill of methyl alcohol. Even after subtracting this 5,000,000 figure, the number of fish killed by industrial wastes is nearly double the next named source of total number of fish kills, domestic wastes.

FISH KILL SUMMARY BY SOURCE OF POLLUTION

Source	Number of reports	Reporting number of fish Reports	Fish
Mining operations	10	5	250,312
Agricultural poisons	81	32	73,110
Domestic sewage	27	14	286,800
Industrial wastes	98	56	5,463,450
Other sources	38	20	38,202
Unknown	51	31	189,756
Total	305	158	*6,023,822

* Adds to 6,301,630 because of 277,808 fish reported from more than one source.

For whatever men say in their blindness,
And spite of the fancies of youth,
There's nothing so kingly as kindness.
And nothing so royal as truth.



Fishing for Allegheny Salmon in the Silver Mountains

▲ My cast arced the water, hit with a wet "splat," and sank into the green depths. The sinker bounced bottom a couple times, then held. While waiting for the inevitable strike I looked around to enjoy the remarkable scenery.

To the west, across the river junction, a sheer mountain wall went straight into the sky. It reminded me of Pine Creek Gorge. Behind me, a solid gold mountain, framed by three surrounding mountains of sheer silver, loomed high in the eastern sky.

To the southeast I saw three more mountains—one silver, one blue, and one garnet color. To my south, behind a grassy ridge, an old fort kept watchful vigilance over the meadows and river approaches.

Just then my vista viewing was interrupted by a strike. Mmmph! I had him! The rod-tip bent like a drawn bow and the line hissed through the water as the fish ran dogged and deep in the channel. Would he be a steelhead trout, or perhaps a pink-sided fighting rainbow?

Nope! He was none of these.

It was an Allegheny salmon; and the silver and gold mountain peaks rising around me were part of a range known as the Gateway Center. You see, I was fishing at "The Point" in downtown Pittsburgh.

"The Point" is at the very tip of the V-shaped piece of land where the Allegheny and Monongahela Rivers meet to form the mighty Ohio. It forms the vortex of the "Golden Triangle," also known as downtown Pittsburgh.

Hemmed in by gleaming silver skyscrapers, with the golden Pittsburgh Hilton in the foreground, Pittsburgh's historic point might seem like a far-fetched fishing hole. Actually it's not.

The Allegheny River in particular has been fished at The Point by the people of Pittsburgh for the past 200 years. It was fished by Indian scouts, by French soldiers from nearby Fort Duquesne, and later by English soldiers after they renewed their lease and changed the name back to Fort Pitt.

Considerable controversy exists concerning the variety of fish life now inhabiting these waters. I have

heard reports of every known species, from striped bass and halibut to golden trout and Spanish mackerel. Based strictly on my own private creel census I can attest to the presence of carp and Allegheny salmon, known locally as catfish.

I further suspect there may be some river minnows, possibly a few small pan fish, and almost certainly some migrant gold fish. Occasionally a few small bass are reported but these are surely scouts from the upper Allegheny who have come down to test the water, and succumb to fishhooks before they can rectify their error.

The predominate fish, however, is that humblest member of the *Siluridae* family, the bewhiskered catfish. From time to time polluting jolts of acid have passed down these rivers, eating away steel bridge girders, dissolving solid stone, and corroding holes in the boats and rivercraft. But the Point catfish, a remarkably hardy breed, merely surfaces for air, takes a few gulps of fresh oxygen, and goes on his way none the worse for wear.

As for carp, these timidly biting jugheads are taken less frequently but are by no means uncommon. They may go to several pounds in weight and I have heard of a mossy-backed old lunker which haunts the depths under the Manchester Bridge trailing a virtual tackle store of equipment from the corners of his mouth.

One convenient feature about fishing at "The Point" is its easy accessibility. From the North Side you can get there on roller skates in less than a half hour, and from the South Side by scooter-bike in about forty-five minutes, not counting red lights.

From more distant points, commuter buses are available to those having the 25c fare. These discharge sportsmen within a few hundred yards of the river bank.

Because of the ferocity with which Allegheny salmon struggle upon being hooked, fishing at "The Point" is no sport for old-timers or faint-hearted fishermen. It requires the vigor and stamina of youth to do combat with them. Thus the average age of the anglers is between eight and sixteen years. You also find older fishermen plying their sport along the Duquesne Wharf; but the noticeable emphasis is on youth.

Owing to its removal from hot-dog stands, most anglers find it advisable to bring along their own bologna, liverwurst, and peanut butter sandwiches which they wash down with quantities of lemon-lime soda pop. This sandwich, incidentally, is invariably a combination deal, not three separate sandwiches. Properly constructed between two halves of a loaf of bread it may weigh a pound or more and care must be taken not to drop it on one's foot.

In any event, these provisions, together with the remarkable scenery, and the numbers of Allegheny salmon which rove these waters, all combine to make a day of fishing at Pittsburgh's Point a truly unforgettable experience. As Roderick Haig-Brown once remarked of England's River Dove where Izaak Walton himself once fished: "May all anglers and very honest men find the way there before they die!"—*Jim Hayes*

Take 'Em Home and Smoke 'Em!

Some carp are taken home and an honest effort is made to eat them. But the usual processes of cooking carp do not produce good table fare. This meat must be soaked and marinated to make it really good.

So, even when carp is taken home and prepared, most of it winds up in the garbage can. Worse, yet, thousands of pounds of this highly nutritious meat are just left along the rivers, lakes and swamps where the fish were killed.

There is a way to prepare carp, however, which seems to please almost everyone's taste. In fact, most people consider smoked carp a real delicacy. And smoking fish is easy.

Whenever possible, carp should be killed so that they will bleed out well. If taken on hook and line, they should not be permitted to die in the bottom of the boat. They should be kept alive on a stringer until all can be cleaned at once. Or the heads should be severed as the fish are caught and cleaning completed immediately. If this is done, the fish should be kept refrigerated.

For smoking, the carp should be filleted. This is done by cutting along each side of the backbone down to the big ribs and then removing the slab of meat on each side. This will give you a boneless piece of meat.

The skin is removed by laying the slab on a flat board or table, skinside down, and cutting the meat free with a gentle sawing motion with a long, thin-bladed knife.

The fillets should then be split or cut to form pieces weighing about a pound each. It is desirable to have all pieces about the same thickness, usually not over $\frac{3}{4}$ of an inch thick.

The smoker can be made from an old ice box, a new garbage can, a lard pail or a clean oil drum. The fish are placed on a grill, made from stiff wire or regular oven racks, or hung from skewer rods inserted near the top of the container. The lid is used but holes should be cut in it to permit smoke to escape slowly. A door or flap at the bottom is necessary for starting the fire and to provide a draft.

The easy way to generate a good smoke is to put an electric hot plate in the bottom of the container or ice box and place an old frying pan on top of it filled with the right kind of sawdust or wood chips.

The other way is to start a charcoal fire, wait until it has burned to a low, even heat and then add the chips or sawdust.

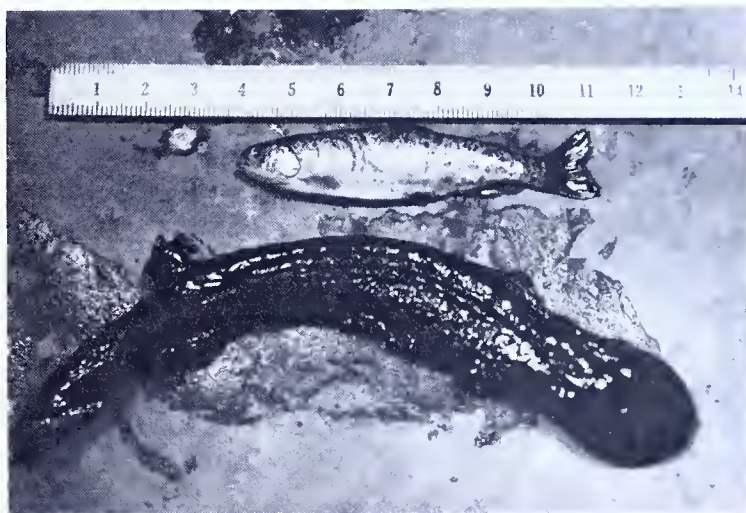
Only hardwoods are good for this purpose and hickory is the favorite. Apple is another good one. During the smoking process, new wood may have to be added several times.

Fish curing can be done in two ways—the one for immediate use and the other for holding the fish indefinitely.

For immediate use, soak the fish pieces in a brine made by adding a cup of salt to a gallon of water for 30 minutes. Then rinse in cold water and dry with a paper towel. Smoke for $1\frac{1}{2}$ hours. Brush fish occasionally with a little corn or vegetable oil.

What Do Hellbenders Eat?

Well, . . . fishermen get into plenty of conversation and argument as to what these slimy, horrible-looking things eat . . . live or dead fish. Johnny Nicklas, Pennsylvania Fish Commission photographer, placed one of the creatures in an aquarium with other fish to find out for himself. Two days later he caught one of the "pretty boys" with a 7-inch rainbow sticking out his mouth. The hellbender was just over 12 inches.



For a more lasting "cure," soak the fish for 12 to 18 hours in a brine made with $1\frac{1}{2}$ cups of salt to a gallon of water. Again wash in cold water and dry. Smoking will take three to six hours or more, depending upon the temperature inside the container and the thickness of the strips. Temperatures should be between 150 and 200 degrees Fahrenheit.

Although smoked fish can be kept for some time without being refrigerated, the best storage is in the deep freeze. Never put the fish in a covered box or bag.

The end-product can be eaten without cooking and is delicious this way but the best flavor is restored by heating a short time in the kitchen oven.

Game birds, venison and other meats can be smoked in this apparatus. Those who are not particularly fond of wild game are often enthusiastic about it when it is properly smoked.

—Roger Latham

Boating



LOADIN' UP . . . perhaps to put 'er up for the winter. Before retiring that outboard to the mothballs it's wise to winterize!

Winter Storage for Outboards

Before you retire your outboard motor to the mothball fleet for the winter, there are a number of things you can do which will prolong its life and lessen your make-ready chores in the spring.

If you can't take your motor to an authorized outboard service shop for winterizing, you can do the job at home by following these suggestions:

1. Place your motor on a stand in an upright position. Take out the spark plugs and **GROUND THE SPARK PLUG LEADS**. Failure to do this may result in serious damage to the coil in some engines. Pull the starter cord slowly several times to drain out any water trapped in the water pump.

2. Next drain and clean the carburetor bowl, filter bowl and fuel lines.

3. Drain built-in fuel tanks and discard the gasoline mixture since it is likely to deteriorate before spring. You can save fuel in pressure tanks if you maintain the pressure.

4. Squirt enough good grade motor oil in both cylinders to provide adequate lubrication. Don't use penetrating oil which might cause corrosion. Pull the motor over several times to distribute the oil. Utilize the old spark plugs for winter storage.

5. After replacing the motor cover, open both plugs in the lower gear case and drain the gear lubricant. Check it carefully for traces of water which will appear in the form of bubbles in the oil. If you find numerous water bubbles, it's possible that a gasket or seal in the lower unit is leaking. Have this checked by your local authorized outboard service man. If the lubricant is water free, refill the gear case with new lubricant. Force the lubricant from a pressure can through the lower plug until it runs out the top vent.

6. Grease all external moving parts of the motor. Then go over the entire surface with a cloth soaked in

Autumn Is Time for Colorful Boating

Falling leaves and quiet waterways need not signal the close of the boating season. Each year more people are discovering that autumn has much to offer in the way of pleasurable boating. The spectacular panorama of colorful shore lines and cooling blue water surpasses the beauty of any other season. It is truly an ideal time to take to the water in your boat.

Although swimming and water skiing are curtailed, except for the avid enthusiast who resorts to special clothing, a light jacket will suffice to adjust for the temperature difference from the sun's summer rays and enable the boatman to enjoy many other boating activities. It is suggested you determine the season by the weather rather than the calendar.

Fall is the time for cruising. Leisurately plying the streams and lakes of wooded country and observing nature as it prepares for the coming winter is an experience long remembered. The vivid colors and soft hues blend to form nature's unequalled grand finale.

With today's emphasis on commercialism and material things, an autumn afternoon on the water will do much to acquaint the youngsters with the placid, yet exciting, beauty of nature. Precise formations of geese passing over the waterways on their way to winter habitats make even the most spectacular television presentation trivial by comparison.

A summer campfire is never quite as welcomed as one on a crisp autumn evening. Camping out, with the piney fragrance of a warming fire in the air, is a satisfying experience. With a boat, a family can get away from the commonplace camping areas and parks and discover their own private site along a secluded shore line. Plenty of food is a must, as nothing stimulates a hearty appetite as much as the clear autumn air.

Many anglers find autumn fishing to be the best. The heavy pressure of summer fishing is off and the fish are more active in the cooler water. Consequently, you'll find them more receptive to your lure.

Don't be in a hurry to put your boat away for the season. There is still a lot of good boating weather ahead and if your rig is stored away too soon, you're going to miss out on some really enjoyable days afloat.

gasoline and oil. This will prevent corrosion from forming on the outside of your motor during the winter.

It is advocated that owners of motors used in salt water should run their motor in fresh water before storing it for the winter. Older motors not treated for corrosion are likely to have deposits of salt crystals in their water jackets. Such deposits cause metal deterioration during the storage period, and should be completely removed by thorough flushing.

Fire No. 1 Boating Hazard

With water, water everywhere fire, it would seem, is of only nominal concern to the skipper of a small boat.

Yet, of the comparatively few boats that run into difficulty during the summer months, statistics show that fire is the most common troublemaker. In 1960 fires and fuel explosions caused \$963,900 in damages to boats, the U. S. Coast Guard reports. And most boat fires are gasoline fires, caused principally by carelessness—such as failing to wipe up spilled gasoline, or failing to make metal-to-metal contact (fuel hose nozzle to tank fillpipe) in fueling.

The slightest spark can ignite a boat fire because it takes very little gasoline vapor—combined with air—to create a highly explosive mixture. And gasoline readily changes from liquid to a combustible vapor, even in cold weather. The rule is ventilate, ventilate and ventilate.

Since gasoline vapors are heavier than air they flow downward and collect in confined spaces; the bilge of a boat, for instance.

Armed with this knowledge the boatman should heed these safety precautions:

—Prevent gasoline from spilling when refueling. Outboard fuel tanks should be filled on the dock rather than in the boat.

—Be wary of using any equipment—from open lights to cigarettes—that could be the source of a gasoline fire.

Common sense dictates that these precautions are doubly observed when the refueling process is taking place. In this regard, the skipper should be sure that all engines, fans—any equipment remotely capable of creating a spark—are stopped during refueling. Other sources of ignition—electrical wiring, switches and fuses—should be located well above the low areas where these vapors might gather.

Weather

The wise boatman is always aware of the weather. A few minutes spent in checking the existing weather and sea condition, as well as the forecast for your area, is common sense. In addition, the good boatman will always keep an eye on the weather when he is operating. At the first sign of threatening weather he will seek shelter.



Sensible Boating Is Safe Boating

Overpowering a boat—whether it's an inboard or an outboard—is an exercise of poor judgment for several reasons.

An engine is souped up usually for one reason and that's to get more speed. Excessive speed not only is unsafe . . . it's excessively expensive, too.

Every boat is constructed with a definite built-in speed limit. When this speed is surpassed, the boat becomes less seaworthy. It gathers a sensitivity to even small ripples on the water . . . and this can be dangerous when making a turn.

Moreover, when the optimum number of revolutions produced by the engine is exceeded, each mile per hour of speed gained takes its toll in fuel consumption. By upgrading an engine a person is accomplishing the same undesirable combination achieved by putting an oversized engine on a boat in the first place.

Eventually, this excess will cause an engine to wear, and service bills will join the fuel bills and the "hot-rod's" unsafe attitude. The person who overpowers his boat to show off its speed should consider the safety of others, if not himself.

Approved Label on Life Preservers

When you're in the market for life preservers or cushions, make certain they bear the attached tag: "U. S. Coast Guard Approved."

After an outing the safety cushions and life jackets may be wet or damp. In order to keep them in top shape and retain their buoyancy characteristics, they should be dried as soon as possible. This will prevent rot, mold and possible extensive damage.

Several Reasons for Fuel Failure

Fuel failure in your outboard motor may be caused by one of several reasons. The most obvious is that the gas tank is empty. The fuel lines may be pinched or kinked. The fuel line may be improperly connected or may have been accidentally disconnected. Water may have accumulated in the fuel filter bowl of the carburetor.

If these more obvious reasons have all been checked and the fuel still does not flow properly, it may mean an internal malfunction that should be checked by an expert.

Why Is a Canoe So Unstable?

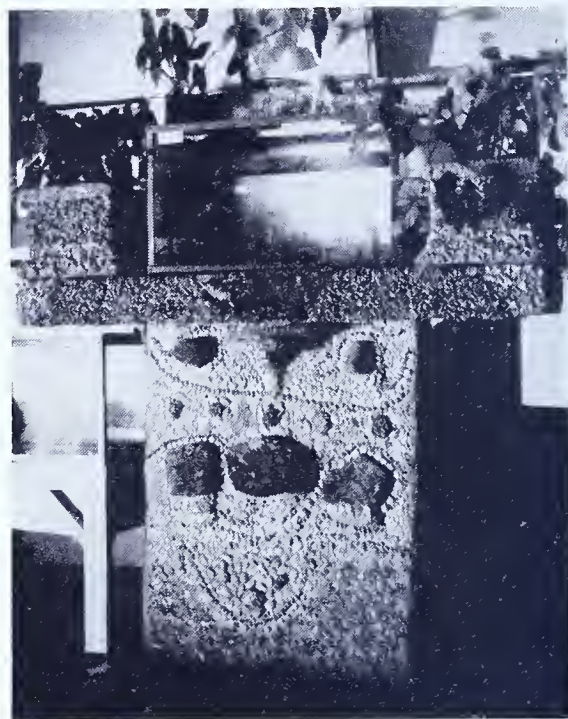
It isn't; it's we who are unstable, for putting a seat in the canoe and raising the height of the passenger so high that the craft has become unseaworthy. Pound for pound, man has never built a better vessel than the canoe, whether it be birchbark, dugout, kayak or a canvas job. We stole the idea of the canoe from the Indians, but not the idea of how to handle it. We perch ourselves up on the seat, raising the center of gravity above the water line, instead of kneeling on the bottom to become a part of the craft.

There's a moral here that applies to would-be designers of larger craft as well.—*Upstream*

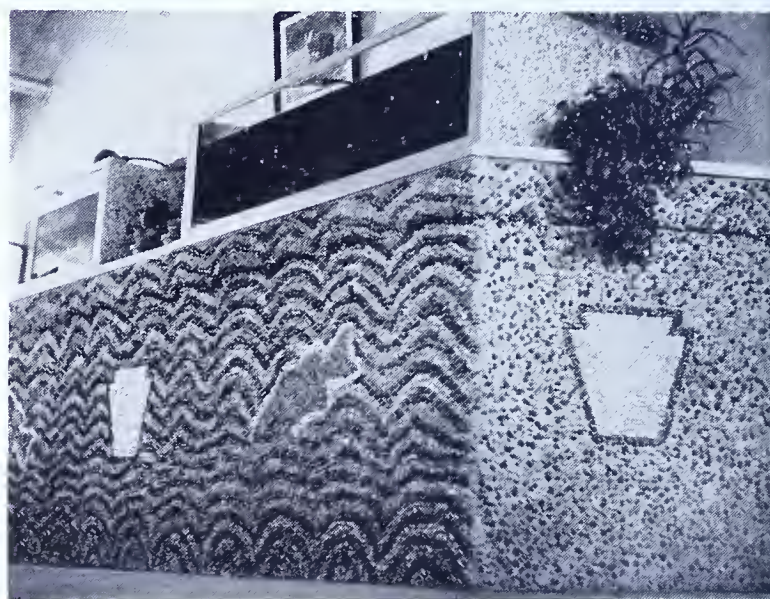
Aquarium Art Popular With Hatchery Visitors

Visitors at the Fish Commission's Pleasant Mount and Reynoldsdale hatcheries are especially intrigued by the colorful stone art work in the Aquarium rooms. In 1930, William Buller (deceased) completed the designs of the stone art work consisting of seven stands to support the aquariums. Stone used for the designs was secured from bits and pieces left over from a headstone company and, as an added oddity, sea shells were used to supplement the patterns.

The late Edgar Davis (a fish warden at the time) learned about the stone art work at Pleasant Mount, visited the installation to have a look at Mr. Buller's handicraft. Davis commenced collecting native colored stones in the vicinity of the Reynoldsdale hatchery which he cut and sorted to size and color. From the original Davis design and collection of stones, James Morgart and Earl Mock (both retired Commission employees) completed the Reynoldsdale masonry.



WILLIAM BULLER'S original stone art aquarium stands at Pleasant Mount hatchery as completed in 1930.



EDGAR DAVIS art stone bases as he designed them at Reynoldsville hatchery.



CLOSE UP of Reynoldsdale stone fish.

Veteran Commission Staff Members to Retire

**Thomas O'Hara and Dewey Sorenson will take
time out to Fish and Travel**



THOMAS F. O'HARA, who has been connected with construction and engineering projects for the Pennsylvania Fish Commission since April 1, 1924, will soon retire. O'Hara's employment with the Fish Commission actually extends over 38½ years, including the thirteen-month period, 1917-18, when he served as chauffeur for N. R. Buller, commissioner of fisheries.

O'Hara became chief engineer in 1928, at which time he supervised the building of the Tionesta Hatchery. Since then he has supervised the building or rebuilding of all of the Commission's hatchery facilities.

Since 1952, the engineering department, under the direction of O'Hara, has been responsible for the planning for and supervising of the construction of more than ten fishing lakes. O'Hara also has supervised the development of the Commission's long list of fishing and boating access facilities.

O'Hara and his wife, Elizabeth, plan to continue to reside in their State College home.

"We are going to spend a lot of time visiting with our children and grandchildren," he said. The children include Mary, of Norwich, New York; Mrs. Joan Nickerson of Topeka, Kansas; Mrs. Margaret F. Hensler of Holly, New York, and Thomas M., a first lieutenant in the Air Corps at Minot, North Dakota.

O'Hara says that he expects to devote much of his spare time to hunting and fishing, and possibly do some consulting engineering work.



DEWEY SORENSON, who has been directly connected with the Pennsylvania Fish Commission's propagation program since November 5, 1917, has announced that he will retire as soon as possible.

Sorenson, who has been superintendent of hatcheries since January of 1956, began his tour of duty at the Corry Hatchery forty-four years ago. After serving thirteen years there, he was transferred to Bellefonte in 1930. He was superintendent of the Bellefonte Hatchery for twenty-six years.

Upon his retirement, Sorenson and his wife Vera plan to reside in Corry, where both were born. The Sorensens have two children, Mrs. Ronald Bloch of Cleveland, Ohio, and Dr. George D. Sorenson, Jr., of St. Louis, Mo.

Many changes have taken place in the propagation and distribution of fish during his career, according to Sorenson. At one time, practically the entire propagation program of trout and other species was geared to the production of fingerlings. Today the efforts of Commission personnel are directed almost entirely toward the production of legal size fish.

Sorenson recalls the period when the bulk of trout distributed any distance from the hatcheries was transported in cans hauled in the railroad baggage cars.

The veteran Fish Commission employee plans to travel to "many of the spots in the United States and Canada which I have always wanted to see but never had time to visit."

The Editor's Angle

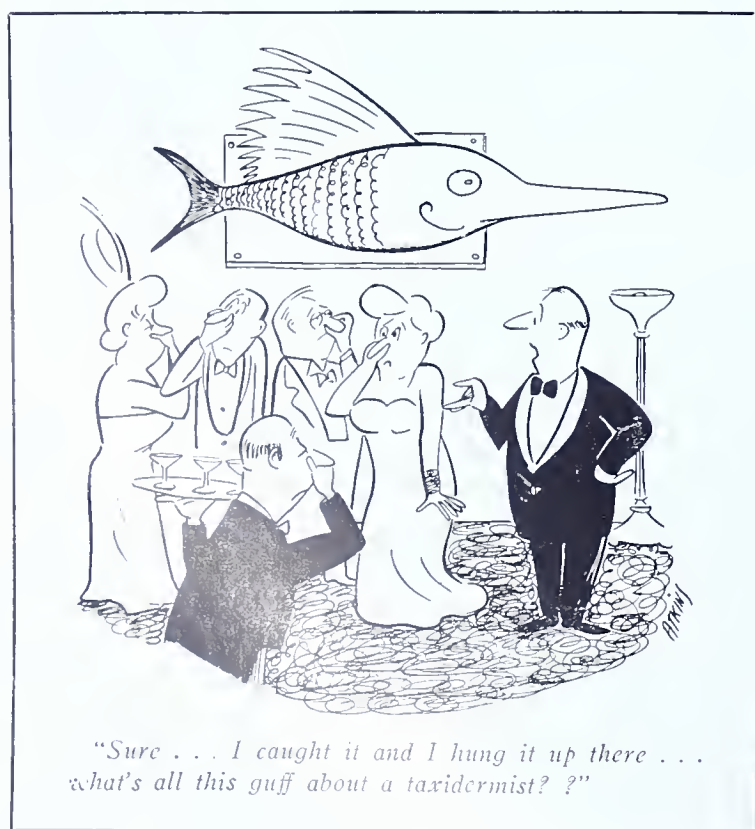
Union City Hatchery nets between 40 and 50 muskellunge each year from Canadohta Lake. After the spawn is taken from these fish they are returned to the lake. Fishermen, hereabouts, were beginning to believe these were "ghost" muskies because few were taken by anglers. District Warden Norman Ely (Erie) reports Harold Powell, Union City, put an end to the "ghost" theory when he caught a 32-inch, 8-lb. musky on August 26, with left pectoral fin clipped that was stocked as a fingerling. On the following day, Powell caught another musky 32 inches, 10 pounds with tag attached proving this fish had gone through the spawning treatment at the hatchery.

* * *

Set an example to young fishermen—show them that good manners in the woods save lives and property. Stash litter in proper receptacles, not in an unsightly cache. Let's all help Keep Pennsylvania Clean!

* * *

District Warden Clifton Iman (Butler-Beaver) was contacted at the Fish Commission's live fish display, Butler Farm Show, by John Conetti, Cabot, Pa. Mr. Conetti showed the warden a brown trout 26½ inches long, weighing 6½ pounds he caught in Buffalo Creek (Butler). When asked if he was going to have this prize mounted the answer was . . . "naw, this is a small one, I caught a 28-inch, 7¾ pounder from the Buffalo last month."



Sportsmen who have some spare fly tying materials or equipment can give Ray Grafton of Blairsville a real assist. Grafton would like to teach fly tying in the occupational therapy shops at the Torrance State Hospital. He needs feathers, fur, hooks and the other materials and equipment needed for this work, which has proven so important in occupational therapy.

"The kits would stay in the shops and be used for patients only," said Grafton. Any sportsman desiring to donate materials or equipment to this good cause should send them to Ray Grafton, Torrance State Hospital, Torrance, Pa.

* * *

Warden Richard Owens (Huntingdon-Mifflin) says the Rays-town Ski Club had a real successful Ski Show on August 26 and 27. Hi-Lite of show was Earl Flick, State College, on a flying kite. On breezy day kite can lift a flyer 75-100 feet above the water while towed behind a boat. Harry Hooper, Huntingdon, club president, figures some of his club members will now take courses in parachute rigging so they can also go fly a kite.

* * *

Warden Kenneth Aley (Potter) declares more trout have been caught this summer at Lyman Run Lake than in any other time in the history of the lake. The water, reclaimed last fall, well stocked, has yielded some fine trout.

* * *

Ever use the old term . . . "by hook or crook"? It's an old forestry expression. In feudal times peasants were not permitted to cut trees but had permission to scure for heating and cooking what limbs and twigs they could reach by hook or by crook. The hook was a pruning hook. The crook: a shepherd's crook.

* * *

Fishing the West Branch, French Creek (Erie), for muskies, Herbert Hawley, Corry, Pa., was dumbfounded when a Great Horned Owl dove out the sky, grabbed a LeBoeuf Creeper lure in his talons, took off! Hawley rassled the big "all-out" owl in a show-down battle until bird was captured, dispatched. Witness accompanied victor to Game Protector Elmer Simpson's headquarters in Union City to probate victim for bounty. Warden Norm Ely reported incident.

* * *

Norman Blum, District Warden (Forest-Clarion), checked out a nice musky caught August 30 at Tionesta Dam, that measured 39 inches, weighed in at 14 lbs. Homer Nine of New Brighton, Pa., landed this big fish.

Catfish Baits

To ½ pint blood add 4 tablespoons casein glue. Stir for a few minutes. Now pour mixture into a 1-quart jar, allow glue to set. Cut bait as needed.—Mrs. Irene P. Richwine

* * *

. . . ½ lb. limburger cheese, ½ lb. hamburger, ½ lb. flour. Add water, stir until stiff enough to hold on hook.

* * *

SKIN A CAT? . . . here's one way: Take a pan of very hot water, cut the skin of the catfish just back of the head, dip fish in hot water up to where skin was cut, with one hand. Take dry rag in other hand, grip fish with rag and pull. The skin will come right off and this method does not injure the meat of the cattie.

* * *

"See that little lake?" said the pilot to his co-pilot. "When I was a kid I'd sit in a boat down there, fishing. Every time a plane flew over, I'd look up and dream I was piloting it. Now I look down and dream I'm fishing."

The ANGLER welcomes cards, letters from readers with comments, discussions, suggestions on anything along the angling line: gadgets, tackle, favorite carp, catfish bait recipes, odd happenings astream, observations, humor, plus a question or two we will seek to answer. We may edit a bit here and there for format purposes only. Address: The Editor, Pennsylvania Fish Commission, Harrisburg, Pa.

Gentlemen:

I know I cannot put into words the wonderful time our Scouts had fishing recently. Boys who never fished before caught some beauties. If you could have seen the expression on their faces that alone would have been a "thank you" many times over.

I'm glad to see men like you make things like that possible for boys. Warden Barnhart is a good ambassador to both kids and men. Keep up the good work!

Don Wingard—Camporee Director
Upper Dauphin District

* * *

Sir:

I see plenty of recipes for trout and other fancy fish. How come you never give us good ways to make catfish? What's wrong with eating catfish?

Mrs. Lon Kissinger
Philadelphia, Pa.

How come? It's too fattening, that's how come. No . . . no . . . there's nothing at all wrong about eating catfish . . . they're delicious! And, here are your recipes, Madam, courtesy of J. A. Russell, gourmet grande. . .

RICH CATFISH CHOWDER

1½ cups boned catfish	¼ teaspoon pepper
2 cups water	½ teaspoon salt
2 ounces butter	1 onion, sliced
1 cup cream	1 teaspoon English Mustard
	½ teaspoon walnut catsup

Wash the fish in warm water, place in just enough water to cover, and simmer until tender enough for the bones to be removed. Flake the fish, place in a stewpan with the other ingredients and seasonings. Stew until thick, garnish with slices of lemon, and serve.

FRIED CATFISH

catfish	bacon
flour	salt and pepper

Wipe the slices of fish dry with a towel, roll them in well-salted-and-peppered flour, fry in plenty of hot bacon fat until a golden brown, and serve hot with slices of bacon.

BAKED CATFISH FILLETS

Temperature—350° deg. Fahr. Time—40 minutes

1½ pounds fillets	¾ cup hot milk
6 tablespoons butter	½ teaspoon pepper
3 tablespoons chopped onion	1½ teaspoons salt
¾ cup tomato ketchup	½ cup grated cheese
	2 tablespoons chopped parsley

Place fish in shallow baking pan. Sprinkle cheese over the fish. Mix butter, onion salt, pepper, parsley, tomato ketchup and hot milk. Pour over the fish and bake as directed.

—By Jason Almus Russell

Roger Latham Wins Keystone Press Award

Roger Latham, outdoor editor, the Pittsburgh Press, has won one of the Keystone Press Awards for excellence in newspaper work. The award was sponsored by the Pennsylvania Society of Newspaper Editors, the Pennsylvania State University School of Journalism and the Pennsylvania Newspaper Publishers Association.

BASS SALAD . . . 2 cups flaked cooked bass, 1 cup cooked elbow macaroni, ½ cup diced celery, 1 tablespoon chopped onion, ½ cup chopped sweet pickles, ½ cup French dressing, ¼ teaspoon salt, ½ teaspoon horseradish. Combine all ingredients, chill an hour before serving. Goooot!

* * *

Sonny Haselburger, Ronnie Martin and Jerry Warc, employees of Allegheny Instrument Co., Cumberland, Md., had a big day at Koon and Gordon Lakes (Bedford), according to District Warden William McInay (Bedford). Haselburger landed two bass at the 6-pound marker in addition to pickerel, bluegills and trout.

* * *

WONDER what ever happened to Art Clark's "Dunkers Association." Last we heard it was going pretty good but that was some while ago. No dues were necessary, no meetings, just DUNK up to the hips at least. Club motto . . . "Let us sound out your favorite fishing hole . . . we get to the bottom of things!"

* * *

Pay Through the Nose. . . This expression began in the 9th Century when Ireland was being conquered by Norsemen and Danes. The Irish were compelled to pay tribute or suffer a slit nose.

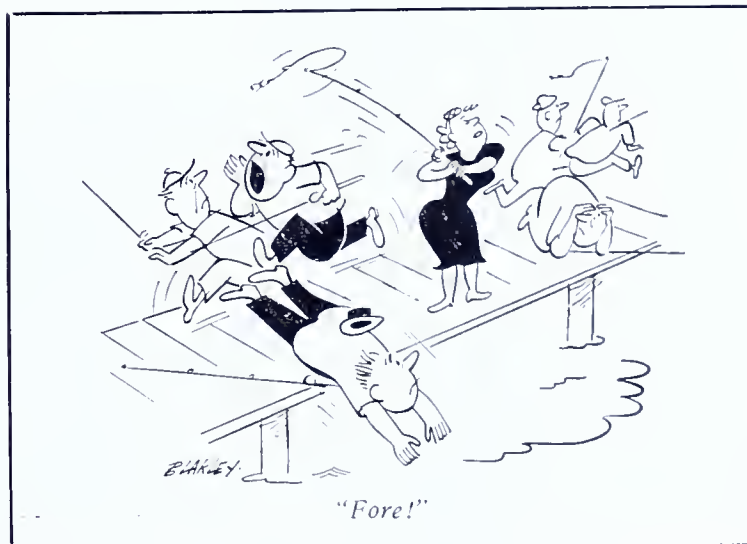
By the time a man gets to greener pastures he can't climb the fence.

* * *

Observation is an old and accredited school in which anyone can enroll. The only tuition is our eyes and our ears.

Philadelphia Seeks Preserve Manager

Unusual opportunity with the City of Philadelphia's Wildlife Preserve: maintains the habitat, conducts tours, keeps wildlife records. Requires a college degree in wildlife management plus 2 years' experience in the wildlife field. Write to J. F. Weiss, Room 792, City Hall, Philadelphia, Pa., for an application. Last day to apply is October 25.



BEST CATCH OF THEM ALL!

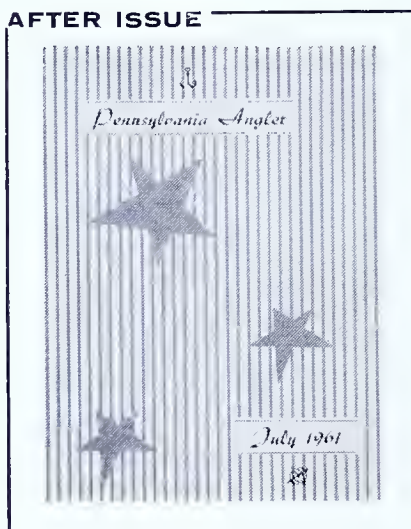
ISSUE



Pennsylvania Angler

PENNSYLVANIA'S FINEST FISHING MAGAZINE

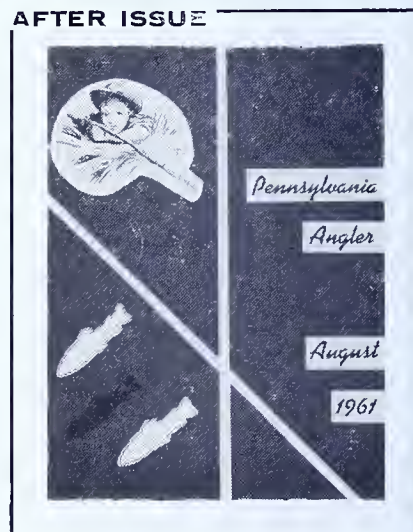
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REVOLUTION

NOVEMBER

1931 - 1961



Pattern for Progress

By

ALBERT M. DAY

Executive Director
Pennsylvania Fish Commission

Much of this issue of the ANGLER is devoted to a brief recital of the accomplishments of the Pennsylvania Fish Commission for the 12-month period ending May 31, 1961. It contains summaries of the work performed in the various organizational units of the Commission. It outlines the pattern of administration, the numerous accomplishments, and the aims and the plans for the conduct of this part of state government. It reveals in diagrammatic form the division of revenue to the Fish Fund and the distribution to the various programs conducted by the Commission.

A recital of this kind can give the reader only general ideas of an over-all picture insofar as fisheries in Pennsylvania are concerned. We, perhaps more than any fishery agency in the Union, are faced with tremendous problems. Pennsylvania's industries for years have poured their industrial and mine wastes into our public waters; cities and towns have traditionally used rivers and streams as the most convenient place to take away from their homes, their factories and their noses, the things that were no longer of use to them. But, Pennsylvania has accepted the challenge and is making real progress through its stringent laws and the day by day activities of its Sanitary Water Board in correcting a situation which once seemed almost hopeless. While we still have setbacks and occasionally lose clean streams because of pollution, the over-all picture is encouraging and the end results in another decade will show continued improvement in the purification of Pennsylvania's waters.

We of the Fish Commission are attempting to make our waters the most productive possible under existing circumstances. The pages that follow recite that effort during the past year. They do not tell of some of the real accomplishments that have occurred since the end of the fiscal year period. These include the most forward step that has been taken by the Commission in many years—the inclusion of new fishing lakes and boating facilities in all sections of the Commonwealth under the provisions of the General State Au-

thority. The recent Legislature approved an authorization of almost 3 million dollars from this source to provide for the development of fishing and boating projects in 13 separate locations within the state.

Progress is being made on the Susquehanna River survey, which seeks to find a solution of fish passage at the dams on the lower Susquehanna. The Commission is cooperating closely with the Department of Forests and Waters to make its newly constructed lakes the most beneficial possible for fishermen. We are working with the Corps of Engineers to insure that their impoundments on the Allegheny, the Delaware and other streams provide their full share of fishing opportunities. We are working with the Soil Conservation Service under Public Law 566 in similar fashion.

Basically, the Fish Commission is doing the best it can with its limited resources—but these are not enough. License sales have declined as costs have increased. More revenues must be obtained if we are to carry on at even our present limited level. Fishermen now pay less than one cent a day for their license. This isn't enough.

Moreover, this resource is of such importance to related industries such as tackle dealers, gasoline stations, motels, restaurants and other businesses that some means other than the mere sale of fishing licenses should be provided. Some states are converting the taxes on the gas and oil used by boatmen into fishing and boating administration rather than into the Highway Fund. Some states are floating bond issues for the expansion and improvement of recreational facilities including fishing. Some states even use revenues obtained from pari-mutuel race tracks to supplement their conservation programs.

Perhaps it is time that we in Pennsylvania take a new look at our total program to see how we can more adequately finance this form of recreation which is of such tremendous interest and importance to all of the people of the Commonwealth.

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NOVEMBER, 1961



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GEORGE W. FORREST, Editor

JOHNNY NICKLAS, Photographer

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All photos by Johnny Nicklas, Chief Photographer
Pennsylvania Fish Commission

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Autopsy of a River

By **RUSSELL S. ORR**, Chief
Conservation-Education Division



BASSE A. BECK, general manager of the Sunbury Daily Item, examines dead fish along the Susquehanna River shoreline.

—Edwards photo, Bloomsburg Morning Press

SOME OF THE DEAD fish, only a hundred of thousands killed by mine acid drainage pollution in the North Branch of the Susquehanna River recently. Holding heavy lines of murdered walleye, bass, suckers, are (left to right): Paul Sevison, Sid Stadlek, Gerald Eveland, LeRoy Troy and William Bickert, all residents of Catawissa.



WHEREAS—One of the most devastating kills of warm-water game fish in the history of the Commonwealth occurred in the North Branch of the Susquehanna River during the period of October 2 to 17, 1961, and

WHEREAS—this fish kill coincided with the period of time when the Glen Alden Mining Corporation was engaged in pumping stagnant waters from deep mine shafts at its new pumping station in South Wilkes-Barre, and

WHEREAS—the State Sanitary Water Board on October 17 issued a "cease and desist order" which shut down these pumps, and

WHEREAS—the fish kill is estimated at 116,280 fish by the Pennsylvania Fish Commission, with a value of \$58,504.50.

NOW THEREFORE BE IT RESOLVED, that the Pennsylvania Fish Commission in regular session assembled at Harrisburg on this 23rd day of October, 1961, respectfully requests that the State Sanitary Water Board in cooperation with the Department of Mines and this Commission, conduct a more complete study of this situation and if the Glen Alden Corporation is finally determined as having been primarily responsible for this unfortunate situation, that their permit to henceforth operate the pumping station in South Wilkes-Barre be conditioned to include the following requirements:—

- 1) The Glen Alden Corporation pays into the Pennsylvania Fish Fund the sum of \$58,504.50, as payment for the fish killed because of their actions, and
- 2) Any permit issued to this Corporation contain a stipulation that pumping from this Station shall be under supervision of the State Sanitary Water Board so that operations may be correlated with adequate river flow to protect the aquatic life of the river below.

FURTHERMORE—the Fish Commission pledges that the payment by the Glen Alden Corporation will be used to assist in the rearing and planting of walleyes, bass and other suitable game fishes in the North Branch of the Susquehanna River as soon as it recovers sufficiently so that the previously flourishing fish populations may be restored to our citizens.

/s/ Gerard J. Adams,
Chairman, Pennsylvania Fish Commission.

One of the worst fish kills in the history of the Susquehanna River occurred early in October. As this issue of the **PENNSYLVANIA ANGLER** went to press, the Fish Commission, which met in Harrisburg on Monday, October 23, took action which it is hoped will lead to the recovery of \$58,504.50 in damages from the corporation responsible for pumping the mine acid wastes into the river.

For more than a week the field representatives of the Fish Commission and the Sanitary Water Board of the Department of Health investigated the source of the pollution which extended from South Wilkes-Barre to below Sunbury.

On October 17, the Sanitary Water Board, after establishing the source of the pollution as being a set of huge pumps installed and operating on the Glen Alden Mining Corporation's property in South Wilkes-Barre, issued a "cease and desist order."

During the investigation period, Albert M. Day, executive director of the Commission, Commissioner Maynard Bogart, Fishery Biologist Robert Bielo and several fish wardens and other Commission personnel were in constant touch with the situation. Bielo was in charge of a crew which made accurate counts of the dead fish found along the 55-mile stretch of the river.

During its October 23 meeting, the Commission passed a resolution to be presented to the Sanitary Water Board, scheduled to meet October 25 and 26. The resolution follows:

Fish Commission Accomplishments

June 1, 1960, to May 31, 1961



Hatchery and Distribution

Installation of additional aerators and equipment at the Reynoldsdale Hatchery for the purpose of improving the water for the growing of trout and in the end it is believed it will also increase the production capacity of that hatchery.

Continuing the program of replacing worn out hatching troughs with large concrete tanks which have proven to be superior to shallow troughs for the purpose of starting and growing of fingerling trout.

Repairing and improvement of some of the ponds at the Pleasant Mount Hatchery.

The construction of a two-story garage and storage building, 60' x 120' is under way at the Bellefonte Hatchery.

Improvement of buildings and facilities for handling of fishery operations on Lake Erie in progress at the newly acquired property on Walnut Creek, Erie County.

Several artesian wells were drilled at the Corry Hatchery for the purpose of increasing the water supply at that place.

Improvement in muskellunge hatching and production facilities at the Linesville and Union City Hatcheries.

The following is a report of the summary of the fish stocked in the waters of Pennsylvania during the period June 1, 1960, to May 31, 1961, showing the species, approximate size, number and weights:

<i>Species</i>	<i>Approximate Size</i>	<i>Number</i>	<i>Weight in Pounds</i>
Brook trout	6 to 18"	664,884	184,332.59
Brown trout	6 to 24"	806,313	278,469.44
Rainbow trout	6 to 30"	611,961	232,676.75
Albino trout	6 to 10"	15	3.65
Total legal trout		2,063,173	695,482.43
Walleye	10 to 16"	1,704	1,248.33
Smallmouth bass	12 to 17"	5,828	7,484.41
Largemouth bass	6½ to 22"	15,936	6,933.01
Muskellunge	28 to 45"	26	262.76
Catfish	7 to 14"	136,555	74,711.31
Bluegills	4 to 10"	24,679	5,945.99
Other sunfish	4 to 6"	4,450	456.35
Yellow perch	7 to 12"	11,385	2,583.55
White crappies	10 to 12"	17,946	17,646.00
Black crappies	7½ to 8½"	900	900.00
Carp	15 to 17"	2,000	4,000.00
Brown bullheads	12 to 14½"	1,135	834.98
Rock bass	7 to 8½"	1,892	697.20
White bass	6 to 10"	11,921	2,935.54
Sheepshead	11 to 19"	5	7.00
Smelt	7½"	8,400	790.00
Chain pickerel	16 to 24"	695	1,330.34
Channel catfish	9 to 14"	20,130	13,457.50
Bowfins	25 to 29"	60	373.00
Total adult warm water species		265,647	142,597.27
Total adult fish and weight		2,328,820	838,079.70
Brook trout	fingerling	896,349	2,130.80
Brown trout	fingerling	401,600	1,108.28
Rainbow trout	fingerling	59,750	1,104.56
Lake trout	fingerling	18,260	874.66
Kokanee	fingerling	1,725	81.53
Kokanee	fry	230,000	57.52
Total fingerling trout		1,607,684	5,357.35
Smallmouth bass	fingerling	30,150	259.96
Largemouth bass	fingerling	214,810	2,053.38
Muskellunge	fingerling	19,904	549.21
Bluegills	fingerling	1,000	14.24
Northern pike	fry	630,000	
Northern pike	fingerling	110	18.99
Catfish	fingerling	50	.80
Fathead minnows	fingerling	7,000	49.00
Walleye	fingerling	103,950	291.76
Walleye	fry	3,897,500	
Eels	elvers	2,200,000	
Total warm water fry and fingerling		7,104,474	3,237.34
Total fry, fingerling and weight		8,712,158	8,594.69

RESEARCH AND FISH MANAGEMENT

Important accomplishments of the Division of Research and Fish Management are summarized as follows:

Space limitation in fish cultural research was overcome to a large degree by the development of new units, for egg incubation and fingerling rearing, which resembled the earlier jar method but were made from 16-ounce plastic bottles. The number of individual experiments that can be conducted is greatly increased with no increase in space required. These units can be used in any fish cultural station and can thus increase the amount and spread of research experiments at far less cost.

In the spring of 1961 research on the life history and culture of northern pike, muskellunge and pickerel was continued. Egg taking, fertilization and incubation techniques were further improved. The culture of northern pike and pickerel was very successful. The fertilization and hatching of muskellunge eggs were far better than any previous year. However, an almost complete mortality of muskellunge fry occurred. This demonstrates a need for more research on fry survival for this species.

The identification and control of fish diseases in state hatcheries continued to be one of the major services of the biological staff at Benner Spring. In addition, a number of commercial hatcheries and cooperative trout nurseries sought aid and advice on fish disease problems.

Several research projects on fish diseases were continued or enlarged. Three drugs for use in treatment of the fish disease furunculosis were evaluated under equal conditions. One drug which is relatively new to the fishery field was found to be a very efficient therapeutic agent for this disease and exhibited no harmful side effects.

Methods on diagnosis, therapy and control for a new serious parasitic disease were continued. Some control of the disease was obtained by disinfection of the water supply. An arsenical drug is also being evaluated for therapeutic value in this disease.

Two research projects are continuing as cooperative efforts between the Pennsylvania State University and the Pennsylvania Fish Commission. One project is concerned with the immunological reactions in the fish disease furunculosis. A year ago it was found that trout showed a high test tube immune response to a one immunization shot of furunculosis vaccine. During the past year it was found that the immunized fish were actually immune to heavy doses of live furunculosis bacteria. This promises to be a major step forward to preventing losses in expensive trout brood stock through this immunization procedure. Oral methods of immunizing fish are also being tried.

A second project is concerned with blood typing in fish. Outstanding progress was made in this study dur-





ing the past year. Blood types have been established in rainbow, brown and lake trout. The pattern of inheritance of the various blood types is now being studied and their correlation with growth, survival, egg production, disease resistance and other factors is being attempted. Similar studies with farm animals, particularly chickens, have paid off tremendously in recent years.

Age and growth studies were made on the important game and panfish of Pennsylvania. A series of seven articles on these studies was prepared for the PENNSYLVANIA ANGLER.

The staff at Benner Spring contributed one paper to the PROGRESSIVE FISH-CULTURIST and a number of articles for the PENNSYLVANIA ANGLER.

An electric fish counter was developed and built at Benner Spring. The counter is used with our mechanical fish sorter and preliminary tests show it to be more accurate and less time consuming than counting by hand.

The big water electro-fishing unit which has been under development for several years was used very successfully at Lake Erie for obtaining northern pike and muskellunge breeders in the spring of 1961. Eggs were taken successfully and the breeders were returned to the lake unharmed. In addition, a number of adult bowfins were collected with the aid of the shocker for an experimental stocking.

Continued assistance was given the Commission's stream improvement program. Streams improved in

1960 were inspected and help was given for the 1961 work plans. A stream improvement demonstration was set up for approximately 500 Boy Scouts in Berks County. A number of the biological staff also supervised stream improvement work conducted by the junior conservation camp.

Personnel of the biological staff again made an analysis of fishing license applications (1960) to determine the percentage of anglers who (1) fished for trout and (2) ice fished the preceding year. Of about 6,500 applications sampled, 49.7 per cent stated they fished for trout. This was a drop of about 7 per cent from the previous year. The number of ice fishermen remained about the same at 6 per cent.

Further studies were made on the "fish-for-fun" project which is now in its fourth year. A continued electro-fishing and angler census indicates a plentiful supply of catchable fish. The overall population has increased slightly in size. At the request of landowners, a section of another nearby stream has been set aside for a fish-for-fun project. A publication summarizing this type of project is to be presented at the national meeting of the American Fisheries Society. This will enable other states to have guide lines to follow should they desire to initiate a similar program.

Personnel from the biological staff at Benner Spring aided biologists of the Army Engineers in the study of the effects of fish passage through two kinds of turbines operating under different hydraulic heads and pressures. The studies were conducted at the Allis-Chalmers Company's hydraulic laboratory in York, Pa. Results of the tests give valuable information on fish survival after turbine passage and should be applicable to Pennsylvania dams as well as the high dams located in the west.

A two-year project on the evaluation of fall vs. spring trout stocking in certain north central Pennsylvania streams was completed during the past year. In general it was found that fall stocked brook and rainbow trout yielded very little winter carry-over but fall stocked brown trout were returned to the creel in fairly good numbers in the spring. Other interesting information was obtained in the study and will be published at a later date in the PENNSYLVANIA ANGLER.

The biological staff cooperated with the Pennsylvania Department of Health in several stream pollution cases during the past year. In two instances, biologists presented data which strengthened the Health Department's cases in legal proceedings.

The basis for a cooperative state-federal trout stocking program was developed as a result of several meetings attended by Commission personnel, representatives of the Fish and Wildlife Service and the Pennsylvania Federation of Sportsmen's Clubs. This program, which is similar to that developed by other northeastern states, will become effective in 1962 and will result in more equitable and economical distribution of the trout from both state and federal hatcheries. Plans to implement this program are now being developed at the Benner Spring Station.

The range of the muskellunge in Pennsylvania has been extended by introduction of hatchery-reared fingerlings over the past several years. Last year 30 waters were stocked which had not originally held native populations. Test netting by biologists in several of these waters showed excellent survival and growth. Natural reproduction has occurred in at least one of the waters. The plantings of past years are now entering anglers' catches in annually increasing numbers. Anglers' interest in this new, large game species is high.

Several research and survey studies were continued on Lake Erie. Experimental trawling gear was again used to determine the commercial availability of the smelt in Pennsylvania waters. Information was collected on the species composition of trawl catches and demonstrations on the use of trawling equipment were given to area commercial fishermen.

Joint biological studies with bordering state agencies and the U. S. Bureau of Commercial Fisheries were again conducted during the past year. Included in these studies was a simultaneous lake wide survey of 15 stations of eastern Lake Erie to determine the range of oxygen depletion in bottom waters brought on by summer stagnation. Last year a 600 square mile area in western Lake Erie was found to have critical oxygen levels in the bottom waters. Assistance was also given to the U. S. Bureau of Commercial Fisheries in their seasonal collection of biological data from Pennsylvania commercial landings.

Other continuing projects on Lake Erie were the investigation of the extent of lamprey scarring on the commercial catch, the survey of lamprey spawning in tributary streams and the evaluation of adult rainbow plantings in tributary streams. The latter project was

conducted in an attempt to build up a spawning run of rainbow trout in Lake Erie. A number of returns of large marked trout show that this project is at least partially successful.

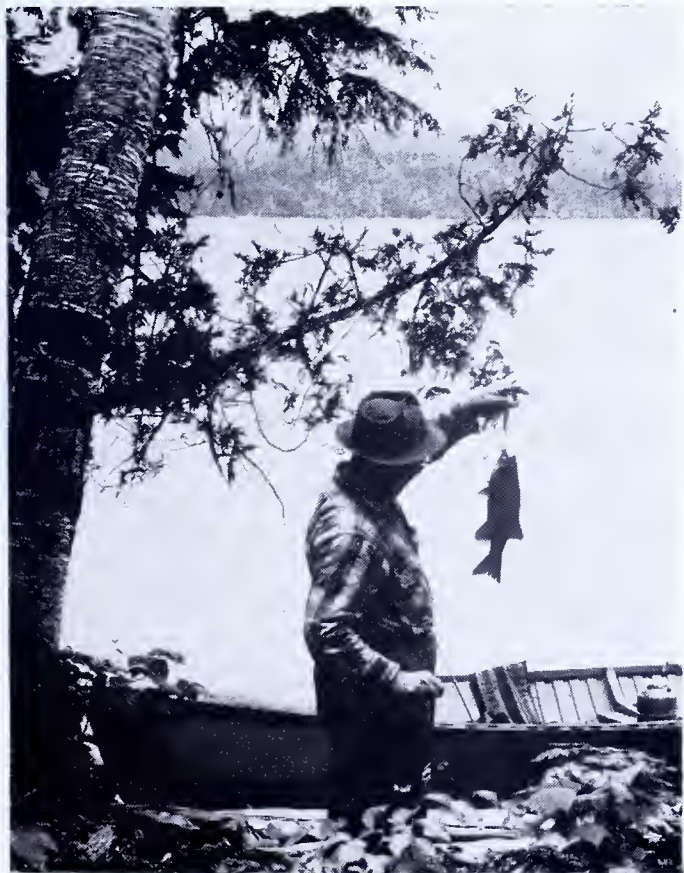
Joint fish management policies, programs and fishing regulations were considered for several interstate waters at meetings with New Jersey, New York, Ohio and Maryland. Most of these meetings were attended by fishery biologists and law enforcement personnel from the states represented. As a result of these meetings over the past several years uniformity in laws and fish management practices are being developed.

Public relations activities in the Division of Research and Management increased appreciably during the year. Public demonstrations of fish populations were made in numerous trout streams using electro-fishing gear. Fish management lectures and displays were presented to many sportsmen's groups, Boy Scouts and other organizations. The demand for special instructional programs for teachers, junior conservationists and professional societies increased. The staff at Benner Spring again conducted more than 50 tours for fisheries workers and others.

Another service rendered the public by the Division was the aging of fish scales sent in by fishermen. Judging from the increased requests for this service, fishermen are becoming more interested in the story behind the fish they catch.

The aim of the Fish Commission's regional fishery managers is to improve fishing in the waters of the Commonwealth through better knowledge of the factors affecting fish life, and through the application of known fish management principles. Over 200 streams and lakes were surveyed by the managers. Many of these surveys were of the "trouble-shooting" variety to determine whether waters were suitable for stocking with trout. Lake surveys were more comprehensive in nature and included such basic studies as fish populations, water chemistry and physical conditions. Fish management plans were prepared for the waters surveyed.

Two experiments were designed to test the utilization of hatchery-reared trout when stocked near areas of heavy human populations, in easily accessible waters and where trout fishing opportunity was at a minimum. In the first experiment, five lakes in southwestern Pennsylvania were stocked just prior to the opening of the season and then weekly for six weeks. Although these lakes held warm water fish populations, conditions appeared suitable for trout, at least until early summer. During a six-week creel census on one of these lakes, 5,428 trout or 57 per cent of the number planted (9,500) were counted in anglers' creels. Actual catch was somewhat greater since an estimated 10 per cent of anglers were not sampled. In a second experiment, which was cooperative with the Fish and Wildlife Service, trout from a federal hatchery were stocked one or more times during the open season in accessible lower portions of streams which had not been stocked with trout before. Although creel censusing was not



possible on these streams, warden observations indicated that angler interest was unusually high in these experimental plantings and influenced by such factors as degree of publicity, accessibility of streams, nearness to cities, other fishing opportunities in the area and the weather. Preliminary results of these experiments indicate that maximum returns of stocked trout may be expected in this type of stocking. Thus, from an economical standpoint, this program seems sound. Both experiments will be continued.

Chemical reclamation in one watershed prior to flooding for a new fishing impoundment was carried out. When filled, the lake was stocked according to a management plan. Evaluation studies were continued in several lakes where primary emphasis is being placed on maintaining predator game species following chemical reclamation and re-stocking.

Fishing opportunity in Pennsylvania is being enhanced annually by various state and federal agencies in an expanded dam building program. In addition to the lakes built by the Pennsylvania Fish Commission with federal aid which are managed primarily for fishing, multiple-purpose impoundments are being developed by the Pennsylvania Department of Forests and Waters, U. S. Corps of Engineers and the Soil Conservation Service. Pre-impoundment surveys and comprehensive fish management plans were prepared for these new waters by the managers.

As a joint conference of Fish Commission engineers and biologists, plans were discussed for incorporating additional facilities in new impoundments for better management practices. Such features as multiple draw off points, improved catch basins and adjacent holding ponds as well as seining areas for checking fish populations and special provisions for the spawning of game species were discussed. If found to be economically feasible, these facilities will insure greater flexibility in the management of these waters.

A fertilizer with high nitrogen content was applied on 3 dates to a Commission fishing impoundment of 253 acres. This lake had annually developed a heavy weed growth which greatly restricted angling and required expensive weed control treatments. The plankton bloom developing from the fertilization was sufficient to discourage rooted aquatics and anglers could utilize the lake throughout the summer. In addition, this treatment may have increased fish growth. The application of fertilizer as an indirect control of aquatic weeds may be economically justified in certain fishing impoundments of this size.

The bowfin was introduced into one lake as a possible means of reducing panfish. The value of the planting for this purpose was not determined since the fish bit readily after planting and were removed rapidly by anglers who consider them an excellent sport fish.

Despite the great size of the Susquehanna Basin, little was formerly known of the factors affecting fish life and fishing there. A comprehensive plan of study of the Basin was adopted and activated by the establishment of 18 check stations extending from Columbia

on the main river to the New York State line on the North Branch. At each station water quality was determined and fish population and other related biological studies made. The West Branch was studied extensively from the standpoint of determining the sources and amounts of acid mine drainage entering the system. This work is considered one of the most important undertakings of the fishery managers since it will serve as a guide for all future programs and developments in this great basin.

The studies of Dr. Harlan Holmes and Mr. Milo Bell, consultants retained by the Fish Commission to study the dams on the lower Susquehanna and to prepare plans for fish passage facilities, continued. Included in their studies were observations on the passage of shad over several dams in the west. In connection with this study, a fishery manager transported fertilized shad eggs from Chesapeake Bay and successfully hatched them in floating hatching boxes at various points on the Susquehanna River in Pennsylvania. Rate of incubation of these eggs was high.

Assistance was given the Office of River Basin Studies, U. S. Fish and Wildlife Service, in surveying and classifying all Potomac Basin streams within Pennsylvania. This is part of a basin-wide stream study for evaluating all future water development proposals within the Potomac drainage.

Fishery managers together with biologists from New York, New Jersey, the Fish and Wildlife Service and Lehigh University cooperated again in the tri-state study of the Delaware River. Data obtained on fish populations, water chemistry and related matters will be used for planning for the future fish management of proposed impoundments on the River.

The shad run into the Delaware River in the spring of 1961 was the largest in many years and proved to be very popular among anglers. The fishery manager and enforcement officer cooperated with the Fish and Wildlife Service in collecting samples of fish scales and other data which were forwarded to a federal laboratory for age analysis. Although several age-groups of shad were represented in anglers' catches, the greatest number fell in age-group IV. A study is now under way by the Fish and Wildlife Service to determine what river conditions existed in 1957 which might account for the high survival of this age-group.

One fishery manager has studied and experimented with aquatic weed control methods for the past several years. This manager continued tests of new herbicides at the Benner Spring Fish Research Station, Bellefonte Hatchery and in several ponds and small lakes in south central Pennsylvania. Two of the compounds tested gave excellent results on specific aquatic weeds. Several papers were prepared on these results and were presented at the 15th Annual Meeting of the Northeastern Weed Control Conference in New York City. In addition, approximately 30 requests for information on aquatic weeds and their control were received. Assistance was given whenever possible on the many aspects of the weed control problem. A mimeographed

paper revising instructions on weed and fish control was prepared and distributed to Fish Commission field men, county agents and other interested personnel.

Miscellaneous work accomplished by managers included assistance in drawing down lakes, fish salvage and an ice-fishing survey on northeastern lakes. Fishery managers tagged a number of fish in a program developed jointly between the Commission and a television station. The Commission's objective was to promote more fishing in the Susquehanna River. Television coverage of this project was outstanding.

ENGINEERING

Preliminary investigations were conducted on the following: Tamarack Lake Site, Crawford County (to be developed in cooperation with the Soil Conservation Service and Public Law 566), topography and subsurface explorations, Dr. Vincent Shepps, Geologist with Department of Internal Affairs, cooperated and worked closely with our Engineering Staff in analyzing the unusual subsurface conditions at this site; Kings Creek Dam Site, Washington County, field reconnaissance and topography survey; Sewickley Dam Site, Westmoreland County, field reconnaissance. Preliminary topography survey and preliminary investigations on the following: Dunlap Creek Dam Site, Fayette County; Harmon Creek Dam Site, Washington County; Kearchers Creek Dam Site, Berks County; and Mauch Chunk Creek Dam Site, Carbon County.

Land surveys were made at Walnut Creek Area on Lake Erie, Erie County, and Yellow Creek Dam Site, Indiana County. Additional work was done on Hammer Creek, Lancaster County, and Negro Glade Dam Site, Somerset County.

Topographic surveys were conducted on Meadow Grounds, Fulton County; Kings Creek, Washington County; Lackawaxen Creek, between Belmont Lake and Pleasant Mount Hatchery, Wayne County; Negro Glade Dam Site, Somerset County; Walnut Creek, Erie County; and Tamarack Lake, Crawford County.

Property and topography surveys were conducted on the following proposed access areas along with the preliminary development plans: Delaware River near Equinunk (Warfield Property), Wayne County; Delaware River near Equinunk (Dillon), Wayne County; Delaware River near Yardley, Bucks County; Juniata River near Thompsettown, Juniata County; Juniata River, Raystown Branch near Huntingdon, Huntingdon County; Juniata River near Mexico, Juniata County; Juniata River near Millerstown, Perry County; Juniata River near Mifflintown, Juniata County.

Engineering plans and specifications were completed on Bradys Lake, Monroe County; Beechwood Lake, Tioga County; to be developed in cooperation with the Soil Conservation Service and Public Law 566; precast concrete toilets for access areas and dams; Harveys Lake Access Area, Luzerne County; and the new

Walnut Creek Hatchery, Erie County, including access to Lake Erie.

Preliminary plans were completed on fishways on Allegheny River in Coudersport, Potter County; Meadow Grounds Dam Site on State Game Lands No. 53, Fulton County; Negro Glade Dam Site, Somerset County; and Tamarack Lake, Crawford County.

The Beechwood Lake project in Tioga County and Tamarack Lake project in Crawford County are being developed in cooperation with the Soil Conservation Service of the United States Department of Agriculture, and are combined flood control and recreation developments. Under this plan, the Pennsylvania Fish Commission is responsible for land purchases and right of ways, road and utility relocations, construction of public use facilities and maintenance. The Soil Conservation Service is responsible for the construction of the dams and appurtenances. Upon the completion of the project the Pennsylvania Fish Commission will have ownership of the entire development.

Improvement on the following access areas:

Long Pond—Wayne County

$\frac{3}{4}$ -mile access road, 50-car parking area, boat launching ramp

Duck Harbor—Wayne County

$\frac{1}{4}$ -mile access road, 30-car parking area, boat launching ramp

Delaware River—Wayne County

25-car parking area with entrance road, concrete beam and blacktop boat launching ramp

Juniata River—Juniata County at Mexico

25-car parking area, entrance road, concrete beam and blacktop boat ramp

Letterkenny Reservoir—Franklin County

Entrance road and 30-car parking area

Waynesboro Reservoir—Franklin County

30-car parking area

N. Br. Susquehanna River, State Game Land

No. 35—Susquehanna County

25-car parking area, concrete beam and blacktop ramp



Allegheny River, City of Franklin — Venango County

30-car parking area with concrete ramp

Canadohata Lake—Crawford County

30-car parking area with entrance road and boat launching ramp

Eaton Reservoir—Erie County

25-car parking area, entrance road and boat launching ramp

Walnut Creek, Lake Erie—Erie County

250-car parking area and boat launching ramp

Big Spring—Cumberland County

2 parking areas (35 cars)

The construction of a 59-acre lake on Opossum Creek, Lower Frankfort Township, Cumberland County, was completed on June 30, 1961. The reconstruction of Mud Pond, Wyoming County, producing a lake of 62 acres was in the final stages on June 30, 1961. Also, essentially complete on June 30, 1961, was the construction of 3.6 miles of paved road, reconditioning of existing dam and the construction of a 50-car paved parking area at Bradys Lake, Monroe County; thus providing much needed access to this 229-acre fishing lake. The final Dingell-Johnson inspection of all three of these projects was scheduled for July of this year.

In addition, the engineering staff supervised the construction of a new storage building and repair shop at the Pleasant Gap Hatchery. This building was about 70 per cent completed on June 30, 1961. Supervised the drilling of water wells at the Corry Hatchery; also assisted the Real Estate Division in the demolition of old power buildings on the Conestoga Creek, Lancaster County, and completed plans for proposed new fish transportation tanks.

Stream improvement work was completed on the following:

Northkill Creek—Berks County

Work on approximately 3 miles of this stream consisted of the following:

1. Nine (9) log dams
2. Two (2) log cribbings
3. Thirty (30) stone dams and deflectors

Buck Run—Franklin County

Work on approximately 1½ miles of this stream consisted of the following:

1. Four (4) single deflectors of log construction
2. Four (4) cribbings of log construction
3. Four (4) watering point piers of log construction
4. Three (3) single deflectors of rock construction
5. Four (4) sections of rock rip-rap
6. One (1) rock dry wall
7. Planted 1,000 trees on banks

Big Spring—Cumberland County

Work on approximately ¾ mile of this stream consisted of the following:

1. Three (3) single deflectors of rock construction
2. Placing of forty-two (42) digger logs
3. Cleaning of 1,000 feet of channel
4. Demolition of old mill
5. Planting of 500 trees

South Branch Little Aughwick Creek — Fulton County

Work on approximately 2½ miles of this stream consisted of the following:

1. Three (3) log fishing dams
2. One (1) log barrier dam
3. Removed 15 major choked channel areas
4. Rebuilt 23 existing stone devices



REAL ESTATE

The Real Estate Division continued with its accelerated pace in compliance with the Commission policy to acquire existing and accessible fishing waters throughout the State. The factors which have made us a rich and advanced industrial State have also threatened our invaluable fishing resources. Urbanization, industrialization and intensive agriculture practices, for instance, have led to a great loss in this natural resource. The Commission's complete awareness of this continued loss has been exemplified by the Real Estate Division's Program of not only maintaining, but improving these natural resources. The results have been gratifying, and the Division was appreciative of the cooperation in its many projects by the U. S. Fish and Wildlife Service and the Soil Conservation agencies.

During the past period, the Maintenance personnel in addition to their regular janitorial and maintenance duties, have been constructing fishing paths at lake access areas, planting trees, fabricating and erecting many signs on recently developed access areas, assisting our Engineers in redevelopment of access areas, and the demolishing of old Commission owned buildings.

In land acquisition work, additional land was acquired

on Stevens Lake in Wyoming County for further development.

The acquisition of land for two lakes is in the final stage of completion; namely, Beechwood Lake Site, Tioga County, and Tamarack Lake Site in Crawford County.

When constructed, the two lakes will provide an additional 600 acres of water for recreation.

The area known as the Straub Hatchery has been acquired for development as an access to Lake Erie.

The purchase of Hunter's Lake in Sullivan County has been completed which opens to the public a lake with over 100 acres of water.

Settlement has been completed on some of the properties on the Hammer Creek Dam Site in Lancaster County, and is continuing on the ones remaining.

Access Areas have been acquired on the Delaware River, Juniata River, the north Branch of the Susquehanna River, the main branch of the Susquehanna, and the Allegheny River.

A "Directory of Public Fishing and Boating Properties" was prepared by the Division listing access areas available to Pennsylvania fishermen and boatmen. The brochure was prepared for publication and distributed free by the Conservation-Education Division.



LAW ENFORCEMENT

In the spring of 1961, the Commission sent eighteen law enforcement officers from various parts of our State to Pittsburgh to attend the U. S. Coast Guard Boating School. These wardens were in the same classes as were Coast Guard recruits and officers. The splendid grades attained were acknowledged by their instructors. Many of the fish wardens have now had advanced training courses in seamanship. The Commission is determined to continue such training of the enforcement officers in the future.

The records show that the wardens spent 83,343½ hours enforcing the Fish and Motorboat Laws. This

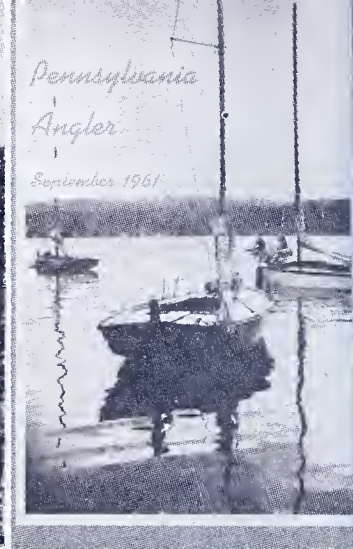
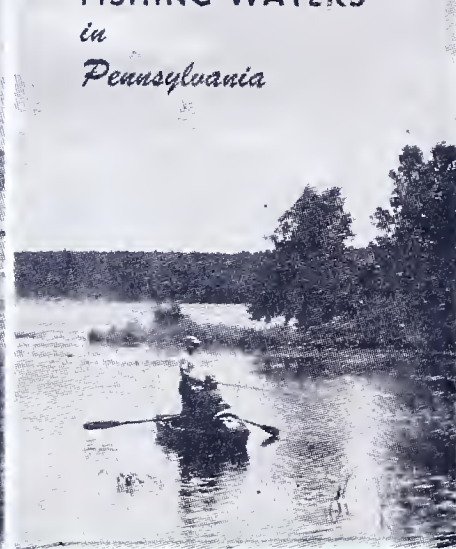
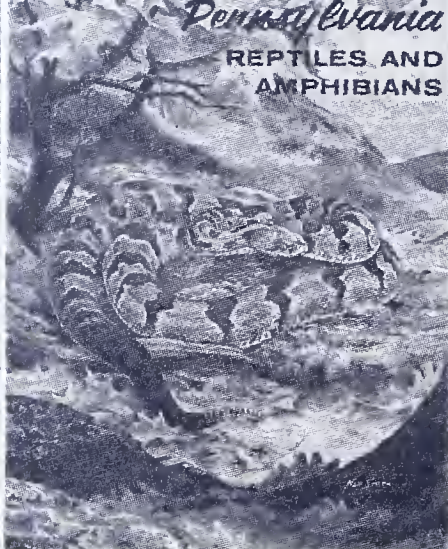
represents approximately forty-eight per cent of their time worked. The other fifty-two per cent was spent assisting hatchery personnel, pollution and mine drainage, channel changes and draw downs, attending sportsmen's meetings, fish management research, lands and waters acquisition, stream improvement, assisting game protectors and other enforcement officers of the State and special assignments. During the year 1960 the wardens investigated 770 mine drainage permit applications for the Sanitary Water Board.

The fish wardens' working day averages 10.9 hours per day for the year. They have recorded the ages of persons arrested and the time of day and the day of the week violations occurred. This information will be compiled in the Harrisburg office for study and analysis. It is hoped that from this study much valuable information will be secured whereby new avenues of approach may be opened to the problems of law enforcement. As far as is presently known, no other state has attempted such a study in this field, but several have indicated their interest in this endeavor.

From June 1, 1959, to May 31, 1960, the wardens investigated fifteen motorboat accidents. Fourteen were nonfatal and one fatal. For the same period the following year they investigated eleven accidents. Eight were nonfatal and three fatal. While the decrease is small it is, however, improvement. Carelessness was the big factor in the majority of the accidents. It should also be mentioned that arrests for motorboat violations have decreased in the same period of time.

The Commission has, at the present time, the best trained wardens in the history of the Fish Commission.





CONSERVATION EDUCATION AND PUBLIC RELATIONS

The Conservation Education and Public Relations Division has been reorganized. This has resulted in an accelerated program for the distribution of educational materials and information to individuals and groups concerned with conservation education in the Commonwealth. It has brought about a greatly expanded distribution of information concerning Fish Commission activities to newspapers, radio and TV stations, outdoor columnists and other news media.

The PENNSYLVANIA ANGLER has taken on a "new look" with more colorful cover pages. The editorial make-up has been expanded to include a boating section. Increased emphasis is to be placed on the use of stories and articles concerning the conservation activities of sportsmen's clubs.

Greatly increased activity has been noted in participation in various teachers' workshops and clinics held throughout the state. The division chief, as well as regional biologists and fish wardens have been called upon frequently for these affairs. In an effort to provide teachers and other educational personnel with the most complete information relative to materials and other types of assistance available, packets of Fish Commission publications have been distributed. Special emphasis has been placed upon the availability of these materials for use in teaching conservation education to the youth of the Commonwealth. District fish wardens answer frequent requests to present slide lectures and talks to school groups on all levels.

These materials also are made available in answer to thousands of requests annually from boy scouts, girl scouts and other organized youth groups. Individual requests from school children are answered as received, with the volume being particularly heavy for several weeks in advance of National Wildlife Week. Added to this there has been a constant flow of requests for information from both fishermen and the general public. While most of this correspondence has originated within the Commonwealth, many requests are received from other states and countries.

Although some requests for information can be answered by supplying printed materials which include the desired information, others require individual replies.

Public relations activities have included the statewide distribution of news releases concerning Fish

Commission activities. These releases normally go to more than 1,100 newspapers, radio and TV stations and outdoor columnists. Beginning with the opening of trout season a weekly report of fishing conditions was sent out to all news media. Frequent requests by writers and editors for special information were given immediate attention. These services included the supplying of special films for use on television programs.

In order to carry the Fish Commission's message to the public, the division chief made more than 50 appearances at public meetings throughout the Commonwealth. These included meetings of many sportsmen's groups, service clubs and other organizations. Here again the district fish wardens have assisted greatly in public relations program. In addition to attending many of the monthly meetings of groups in their respective districts, they also are frequently called upon to provide slide lectures and other special programs.

The Commission was represented at numerous meetings and conferences of conservation organizations. These included the American Association for Conservation Information, Pennsylvania Outdoor Writers Association, Outdoor Writers Association of America, National Wildlife Federation and the North American Wildlife Conference.

The Commission's live fish exhibits attracted more than two and one-half million people at the major sportsmen's shows in Philadelphia, Pittsburgh, Harrisburg and Allentown and county fairs and other events. These exhibitions provided an excellent opportunity for the distribution and sale of Commission publications. District wardens or biologists were in attendance at all of these displays to handle the distribution of materials and to answer questions by the public.

Publications released by the division during the year included, "Fishing Waters in Pennsylvania," a second edition of "Pennsylvania Reptiles and Amphibians," the leaflet "Public Fishing and Boating Properties and Facilities" and a series of PENNSYLVANIA ANGLER reprints on the age and growth of the common fishes of Pennsylvania. Work has been started on a new and greatly improved edition of "Fishing Waters in Pennsylvania," a stream improvement guide, and a revision of the leaflet describing the Commission's muskellunge program.

FINANCIAL REVIEW FOR THE FISCAL YEAR JUNE 1, 1960, TO MAY 31, 1961

By PAUL J. SAUER, Comptroller

The revenues, expenditures and financial position of the Pennsylvania Fish Commission are presented in the following statements and charts, covering the second year of the 1959-1961 biennium. Explanatory comments on each of the schedules are included to facilitate understanding and uniform interpretation of the information presented.

SCHEDULE NO. 1			
CONSOLIDATED STATEMENT OF FINANCIAL POSITION			
AS OF MAY 31, 1961			
CASH			\$1,470,730.50
LESS: LIABILITIES AND WORKING CAPITAL:—			
VOUCHERS PAYABLE—PENNSYLVANIA FISH COMMISSION	\$ 96,280.15		
ENCUMBRANCES—PENNSYLVANIA FISH COMMISSION	695,962.47		
ENCUMBRANCES—DEPARTMENT OF REVENUE	1,669.70		
RESERVE FOR WORKING CAPITAL	600,000.00	1,393,912.32	
NET BALANCE AVAILABLE FOR EXPENDITURE			\$ 76,818.18
DURING FISCAL YEAR 1961-1962			

SCHEDULE NO. I—This schedule reflects the cash balance and the financial position of the Commission at May 31, 1961. It indicates a cash balance in the Treasury of \$1,470,730.50, a decrease of \$3,408.21 under the cash balance one year before, June 1, 1960. Of this cash balance, a total of \$793,912.32 must be reserved to effect payment of the vouchers payable and encumbrances resulting from expenses and costs relating to the fiscal year June 1, 1960, to May 31, 1961, and \$600,000 for working capital to maintain the cash balance at a level sufficient to pay normal operating expenses and costs during the period September through March, when revenues from license sales are substantially lower than operating expenses which remain fairly constant throughout the entire twelve-month period.

VOUCHERS PAYABLE represents invoices submitted to the Auditor General and State Treasurer for payment prior to May 31, 1961, but which had not been paid by the State Treasurer at that date.

ENCUMBRANCES represent commitments in the form of purchase requests, purchase orders and other contracts, and estimates in some cases, covering the purchase of materials and supplies, land acquisitions, rentals, utility expenses, services and accrued payrolls which had not reached the invoice stage but were directly related to the fiscal year June 1, 1960, to May 31, 1961.

NET BALANCE AVAILABLE FOR EXPENDITURE in the amount of \$76,818.18 represents the difference between the cash balance in the Treasury, and all required reserves, and is the amount which is added to the estimated receipts for the 1961-62 fiscal period and becomes a part of the total amount on which the budget for the 1961-1962 fiscal period is determined.

SCHEDULE NO. II—This statement shows that the cash balance in the State Treasury at the beginning of the fiscal year, June 1, 1960, was \$1,474,138.71, from which Vouchers Payable at that date of \$11,550.74 have been deducted, leaving a balance of \$1,462,587.97 available for expenditure. During the fiscal year, this amount was increased by revenues amounting to \$2,800,815.45, resulting in a total of \$4,263,403.42 available during the year. From these funds, \$2,888,953.07 was expended; \$2,722,888.08 by the Fish Commission, and \$166,064.99 by other State departments. These expenditures included the liquidation of encumbrances applying to the prior fiscal year, as presented in the Commission Financial Review published in the November, 1960, issue, amounting to \$442,210.55. The expenditures of \$166,064.99 made by other State departments consisted of \$71,327.41 for printing, issuing and collecting license fees, and \$94,737.58 for contributions to the State Employees Retirement System and Social Security. The total expenditures of \$2,888,953.07 is the total as recorded by the Fish Commission. However, \$96,280.15 of this total represented vouchers not yet paid by the State Treasurer, and this amount must be considered and added to the balance of \$1,374,450.35 to produce the cash balance in the State Treasury of \$1,470,730.50 at May 31, 1961. This cash balance is subject to the reserves shown in Schedule I and explained in the remarks on that schedule.

SCHEDULE NO. III—This schedule shows the expenditures made by the Commission in compliance with the Legislative mandate of Act No. 330, Session of 1957, P. L. 619. Receipts and expenditures are shown on a calendar year basis to conform with the license year. Expenditures, by type, are classified by the nature of the activity to which they apply. The lower part of

SCHEDULE NO. II

PENNSYLVANIA FISH COMMISSION
STATEMENT OF REVENUE, EXPENDITURES AND CASH BALANCES
FISCAL YEAR JUNE 1, 1960, TO MAY 31, 1961

REVENUE

Cash in State Treasury to Credit of "Fish Fund" June 1, 1960	\$1,474,138.71
Less: Unpaid Vouchers in Fiscal Offices as of May 31, 1960	-11,550.74
Net Cash Available for Expenditure as of June 1, 1960	\$1,462,587.97
Receipts June 1, 1960, to May 31, 1961	
Resident Fishing Licenses	\$2,185,388.38
Nonresident Fishing Licenses	101,441.74
Nonresident Trout Stamps	4,413.50
Special Eel Licenses	6.00
Motorboat Licenses	117,781.35
Tourist Fishing Licenses	37,296.85
Lake Erie Licenses	1,633.00
Commercial Hatchery Licenses	8,620.00
Fee Fishing Lake Licenses	4,465.00
Fish Law Fines	33,822.50
Motorboat Fines	7,080.00
Interest on Securities	—0—
Interest on Deposits	26,964.81
Sale of Unserviceable Property (Department of Property and Supplies)	797.71
Contributions for Restocking Streams	33,620.37
Contributions from Federal Government (Dingell-Johnson Act)	195,678.41
Sale of Publications	25,628.28
Rental of Fish Commission Property	6,150.00
Miscellaneous Revenue—Fish Commission	3,442.04
Miscellaneous Revenue—Revenue Department	2,001.79
Refund of Expenditures—Not Credited to Allocations	55.85
Sale of Vehicles (Department of Property and Supplies)	4,527.87
Total Receipts from All Sources	2,800,815.45
Total Funds Available During Year	\$4,263,403.42

CLASSIFICATION OF EXPENDITURES BY ORGANIZATIONAL UNITS

Classification of Expenditures	Executive and General Administration	Propagation	Fishery Management and Research	Law Enforcement	Conservation Education	Land and Waters Management	Engineering and Development	Commission Total
Salaries	\$101,995.52	\$ 617,614.78	\$144,112.10	\$287,343.90	\$ 34,556.40	\$ 38,815.10	\$ 67,319.50	\$1,291,757.30
Wages	4,304.17	41,080.79	20,804.89	12,335.79	—0—	26,131.32	80,822.17	185,479.13
Printing and Stationery	23,105.13	903.98	968.27	278.14	39,994.48	1,521.89	27.00	66,798.89
Food & Storage	35.40	189,920.59	242.00	—0—	—0—	—0—	—0—	190,197.99
Materials & Supplies	1,714.40	62,966.00	10,816.49	7,643.12	4,862.21	8,100.97	59,230.92	155,334.11
Fees	—0—	—0—	12,348.58	139.08	7,330.09	2,188.45	—0—	22,006.20
Traveling Expenses	13,104.80	10,776.16	8,116.24	92,471.98	3,000.15	9,799.20	15,615.37	152,883.90
Motor Vehicle Supplies & Repairs	503.98	27,156.40	4,870.23	—0—	313.91	3,726.88	3,384.38	39,955.78
Postage	2,218.52	1,202.47	787.35	1,530.60	5,566.00	77.00	75.00	11,456.94
Telephone & Telegraph	4,785.41	5,339.94	4,567.00	8,695.99	849.56	656.33	1,008.91	25,903.14
Light, Heat, Power, Water & Fuel	—0—	33,556.69	2,756.61	237.42	—0—	—0—	163.98	36,714.70
Contracted Repairs	1,489.86	5,543.62	1,355.56	1,117.17	390.80	703.88	2,340.05	12,940.94
Rent of Real Estate	—0—	3,144.31	2,278.63	3,123.74	24.00	2.08	—0—	8,572.76
Rent of Equipment	827.10	1,944.79	1,144.35	—0—	72.00	15.00	74,769.27	78,772.51
Insurance, Surety & Fidelity Bonds	997.39	7,098.03	2,501.15	2,695.50	290.00	704.29	1,323.33	15,609.69
Other Operating Services & Expenses	17,463.22	496.67	640.61	521.65	475.95	477.20	232.20	20,307.50
Motor Vehicles	—0—	19,568.15	10,851.46	—0—	—0—	21,277.81	16,529.05	68,226.47
Other Equipment & Machinery	7,110.35	9,600.56	5,159.42	27,110.67	2,747.95	3,392.11	27,349.80	82,470.86
Land	—0—	—0—	—0—	—0—	—0—	229,717.91	—0—	229,717.91
Buildings & Structures	—0—	27,630.61	—0—	—0—	—0—	—0—	—0—	27,630.61
Non-Structural Improvements	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—
Grants & Subsidies	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—
Refunds of Revenues & Receipts	150.75	—0—	—0—	—0—	—0—	—0—	—0—	150.75
TOTAL EXPENDITURES BY FISH COMMISSION	\$179,806.00	\$1,065,544.54	\$234,320.94	\$445,244.75	\$100,473.50	\$347,307.42	\$350,190.93	\$2,722,888.08

Plus: Expenditures by Other State Departments (*)

Department of Revenue	71,327.41
Department of State	56,490.00
Treasury Department	—0—
Department of Labor and Industry	38,247.58

TOTAL EXPENDITURES -2,888,953.07Cash Balance May 31, 1961, Available for Expenditure in the 1961-1962 Fiscal Year \$1,374,450.35Plus: Unpaid Vouchers in Fiscal Offices as of May 31, 1961 96,280.15Cash Balance in State Treasury to Credit of "Fish Fund" May 31, 1961 \$1,470,730.50

(*) These items are paid out of the "Fish Fund" upon requisitions drawn by the other departments and are included for a complete presentation of the "Fish Fund" finances.

SCHEDULE NO. III

EXPENDITURES IN COMPLIANCE WITH ACT NO. 330—SESSION OF 1957

Act No. 330, Session of 1957, P. L. 619, amends the Act of May 2, 1925, P. L. 448. This Act became effective September 1, 1957, and provides that the sum of One Dollar (\$1.00) from each resident and nonresident fishing license fee shall be used exclusively for (I) the acquisition, leasing, development, management and maintenance of public fishing waters and of areas for providing access to fishing waters and the carrying out of lake and stream reclamation and improvement; (II) the rebuilding of torn-out dams and (III) the study of problems related to better fishing.

For the Calendar Year 1960—January 1, 1960, to December 31, 1960

	Fishery Management and Fish Management Research	Reclamation of Lakes and Improvement of Streams	Acquisition of Lands and Fishing Waters	Management and Maintenance of Lands and Fishing Waters	Development of Lands and Fishing Waters	Totals
SALARIES AND WAGES	\$ 88,345.74	\$ 42,586.73	\$ 19,941.83	\$ 34,046.99	\$105,438.57	\$290,359.86
Salaries	75,486.12	26,912.65	18,994.52	15,826.64	32,671.03	169,872.96
Wages	12,877.62	15,674.08	947.31	18,220.35	72,767.54	120,486.90
OTHER OPERATING EXPENSES	29,350.49	21,748.20	8,793.46	19,147.82	139,819.74	218,859.71
Printing, Binding and Stationery	355.99	46.50	365.48	800.91	26.46	1,595.34
Food and Forage	—0—	—0—	—0—	—0—	—0—	—0—
Materials and Supplies	5,083.12	10,551.16	545.99	8,683.43	48,773.85	73,637.55
Fees	3,384.48	—0—	4,416.95	24.00	—0—	7,825.43
Traveling Expenses	7,384.79	6,251.03	1,834.56	6,202.70	9,515.80	31,188.88
Motor Vehicle Supplies and Repairs	3,677.95	1,118.64	444.80	2,019.41	1,742.37	9,003.17
Postage	716.34	66.00	33.48	36.52	133.00	985.34
Telephone and Telegraph	3,059.61	230.13	338.56	300.58	680.14	4,609.02
Newspaper Advertising and Notices	—0—	—0—	—0—	—0—	—0—	—0—
Light, Heat, Power, Water, and Fuel	662.99	39.92	—0—	—0—	126.40	829.31
Contracted Repairs	504.48	1,891.00	101.57	362.54	4,000.11	6,919.70
Rent of Real Estate	2,082.47	—0—	—0—	—0—	—0—	2,082.47
Rent of Equipment	36.04	1,166.46	—0—	—0—	73,599.77	74,802.27
Insurance, Surety and Fidelity Bonds	1,576.62	301.18	182.34	389.19	885.83	3,335.16
Other Operating Services and Expenses	825.61	86.18	529.73	328.54	276.01	2,046.07
EQUIPMENT	15,083.73	30,144.80	143.84	29,426.99	13,449.21	88,248.57
Motor Equipment	9,453.54	3,199.00	—0—	13,406.85	13,330.05	39,389.44
Other Equipment and Machinery	5,630.19	26,945.80	143.84	16,020.14	119.16	48,859.13
OUTLAY FOR LANDS, STRUCTURES AND IMPROVEMENTS	—0—	—0—	153,234.83	—0—	—0—	153,234.83
Land	—0—	—0—	153,234.83	—0—	—0—	153,234.83
TOTALS	<u>\$132,779.96</u>	<u>\$ 94,479.73</u>	<u>\$182,113.96</u>	<u>\$ 82,621.80</u>	<u>\$258,707.52</u>	<u>\$750,702.97</u>

STATEMENT OF RECEIPTS AND EXPENDITURES—ACT NO. 330—SESSION OF 1957

Calendar Year	Resident Licenses Sold	Nonresident Licenses Sold	Minimum To Be Expended	Expenditures	Over (*) or Under (—) Minimum	Cumulative Over (*) or Under (—)
1957 (9-1 to 12-31)	4,444	165	\$ 4,609.00	\$142,467.00	\$137,858.00*	\$137,858.00*
1958	621,692	16,294	637,986.00	452,715.09	185,270.91—	47,412.91—
1959	603,546	16,438	619,984.00	524,014.33	95,969.67—	143,382.58—
1960	587,687	13,107	600,794.00	750,702.97	149,908.97*	6,526.39*

the schedule indicates that cumulative expenditures are \$6,526.39 in excess of the requirements of the Act.

CHARTS—Pie charts are included to present, in graphic form, the revenues received and expenditures made by the Commission during the fiscal period covered by this report.

The chart entitled "Sources of Revenue to the Fish Fund" indicates receipts from all sources of \$2,800,-815.45. This total, which is \$517,215.41 higher than the total receipts for the prior fiscal year, should not be considered normal for a twelve-month period. Eliminating contributions from the Federal Government (Dingell-Johnson Act) which vary widely between years, the increase between the two fiscal years amounts to \$408,193.98 for license sales and other regularly recurring revenues. An analysis of this increase indicates that receipts from license sales were \$425,579.92 greater, and other revenues \$17,385.94 less. This is a distorted reflection of the true situation and results

from the use of a fiscal year beginning June 1 and ending May 31, and the method of collecting and reporting license sales. This distortion is obvious when it is realized that the total of resident, nonresident and tourist licenses dropped 16,996 from 1958 to 1959, and 17,-376 from 1959 to 1960, a total decrease of 34,373 in two years. Accordingly, there could not be an increase of license sales revenue. Since the heaviest revenue from license sales is concentrated in the months of April, May, June and July (approximately 72 per cent), two months of which are in one fiscal year, and two months in the following fiscal year, a delay of a month or two in reporting license sales revenue results in substantial distortions of revenue patterns.

The chart entitled "How the Fisherman's Dollar Was Spent" shows expenditures by the Research and Fishery Management Division of \$234,320.94, or 8.11 per cent of total Commission expenditures. It can be argued, with logic, that a considerable portion of these

Few major changes but a number of minor modifications of the fish and boating laws were made by the 1961 General Assembly.

House Bill 1308, Act No. 308 of July 14, 1961, provides that the fishing license must be "displayed on an outer garment" of the licensee, instead of being merely carried on the person as heretofore.

House Bill 823, Act No. 301 of July 13, 1961, changes the fishing license year from the end of December to the end of February, and extends validity of 1961 licenses the additional two months to February, 1962.

expenditures should be classed as Propagation rather than Research costs. Expenditures of \$63,387.39 (2.19 per cent) which are included in the total of \$234,320.94, resulted in the production of 24 tons of legal trout for stocking, 1¼ tons of fingerling trout, 150,000 fathead minnows and 1,500 largemouth bass fingerlings for transfer and stocking. If these Propagation costs were deducted from the Research and Management Program and added to Propagation, these expenditures would be \$1,128,931.93 or 39.07 per cent; Fishery Management would be \$109,749.15 or 3.81 per cent and the net expenditures for Research alone would be \$61,184.40 or 2.11 per cent. However, these statements and charts were prepared and reported upon in accordance with programs previously established by the Fish Commission and approved by the Budget Secretary. Consideration is now being given by the Commission to a new program which will more clearly reflect these divisions.

AUDIT OF THE FUND

Under the provisions of Article IV, Section 402 of the Fiscal Code, the Auditor General is required to audit the accounts and affairs of all State Departments, Boards and Commissions at least once each year. The last formal audit of the Commission covered the fiscal year ended May 31, 1959.

Additional safeguards and controls imposed upon all Departments, Boards and Commissions are:

1. The mandatory requirement that all invoices, payrolls and other operating expenses must be audited by the Auditor General and State Treasury Departments before payment.
2. The mandatory reporting daily, of all financial transactions to the Governor's Bureau of Accounts and Controls.
3. The control exercised by the Governor's Budget Secretary over all requests for budget allotments and all other budget matters.
4. The periodic verification of Departmental Accounts with those maintained by the Auditor General's Department, the State Treasury and the Governor's Bureau of Accounts and Controls.

House Bill 1588, Act No. 474 of August 22, 1961, eliminates the metal motor boat license tag and provides only that the license number shall be displayed, thereby making other methods of display lawful.

House Bill 251, Act No. 85 of May 9, 1961, gives the Fish Commission regulatory authority over the use of fish nets in Lake Erie. Formerly this was controlled by statute, without any discretionary leeway. It is felt that greater latitude in dealing with this problem may be helpful to the fisheries industry.

House Bill 376, Act No. 466 of August 22, 1961, provides that political subdivisions may petition the Fish Commission to set aside fishing waters for exclusive use of children under 12 and disabled persons.

House Bill 812, Act No. 671 of September 22, 1961, repeals the Frog and Terrapin Act and places its essential provisions in the Fish Law, making some changes in bag limits for frogs, tadpoles and turtles, and requiring a fishing license.

House Bill 816, Act No. 575 of September 15, 1961, provides for issuance of propagation licenses for frogs, tadpoles and turtles, making special provision for live bait dealers' licenses and transportation permits, and requiring live bait distributed in the State to be inspected.

House Bill 819, Act No. 576 of September 15, 1961, includes bait fish in the section dealing with the licensing of bait sellers, and increasing the validity of possession receipts furnished by such sellers from six to fifteen days.

House Bill 817, Act No. 300 of July 13, 1961, eliminates the requirement of annual reports by persons holding artificial propagation licenses.

Senate Bill 114, Act No. 446 of August 18, 1961, provides that under certain conditions fishing without licenses may be permitted in fee fishing lakes.

House Bill 474, Act No. 103 of May 15, 1961, authorizes advance payments up to seventy-five per cent to landowners in Fish, Game and Forests and Waters condemnation cases.

House Bill 1644, Act No. 432 of August 7, 1961, authorizes skindivers to buoy their point of submergence with a red flag not less than 14 nor more than 24 inches square, with a diagonal white stripe. A maximum \$25 fine is provided for operating water craft within 25 feet of such buoys.

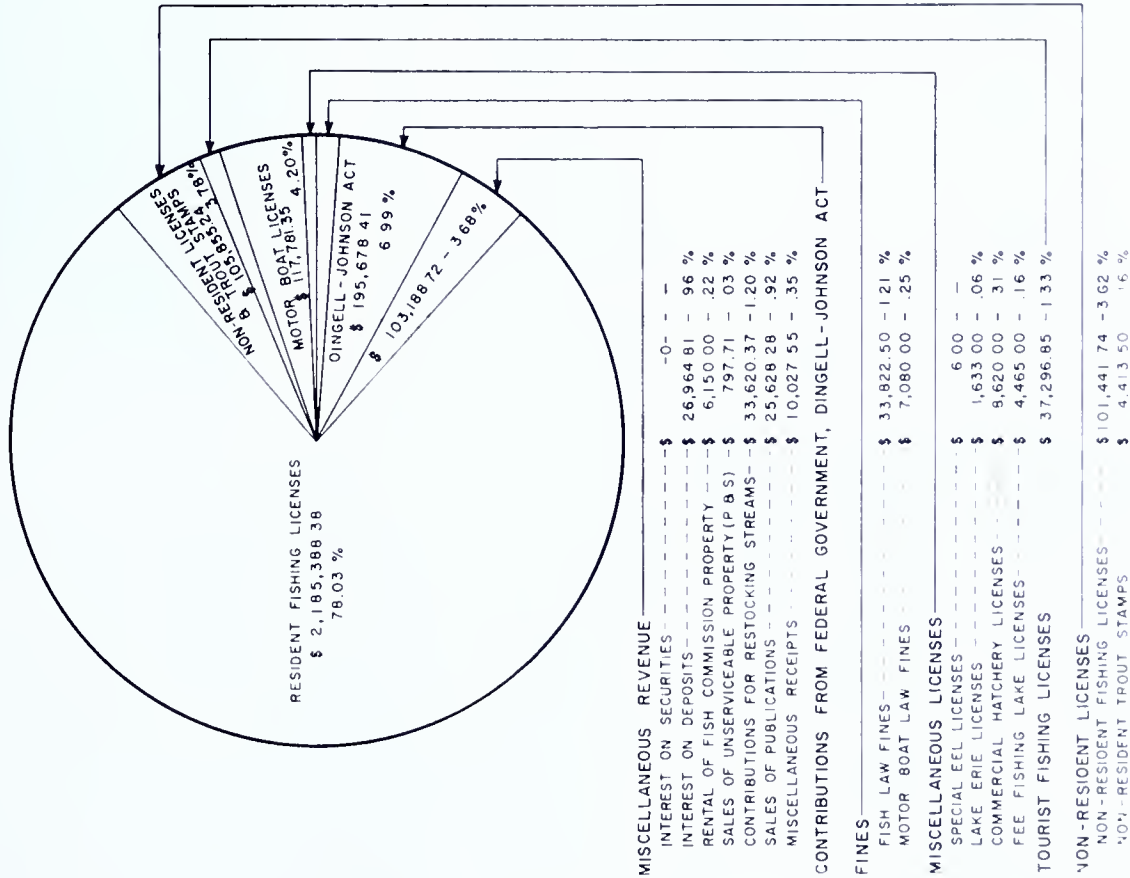
Senate Bill 639, the Act of September 27, 1961, provides that no landowner of agricultural lands or woodlands shall be liable for injury suffered by any person hunting or fishing on his property unless the injury is deliberately and wilfully inflicted by the landowner.

House Bill 238, providing free fishing licenses for persons over 65 and certain disabled veterans, was vetoed on Constitutional grounds, Veto No. 11.

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH COMMISSION

SOURCES OF REVENUE TO THE FISH FUND

RECEIPTS FOR THE FISCAL YEAR JUNE 1, 1960 TO MAY 31, 1961
TOTAL \$ 2,800,815.45



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH COMMISSION

HOW THE FISHERMAN'S DOLLAR WAS SPENT

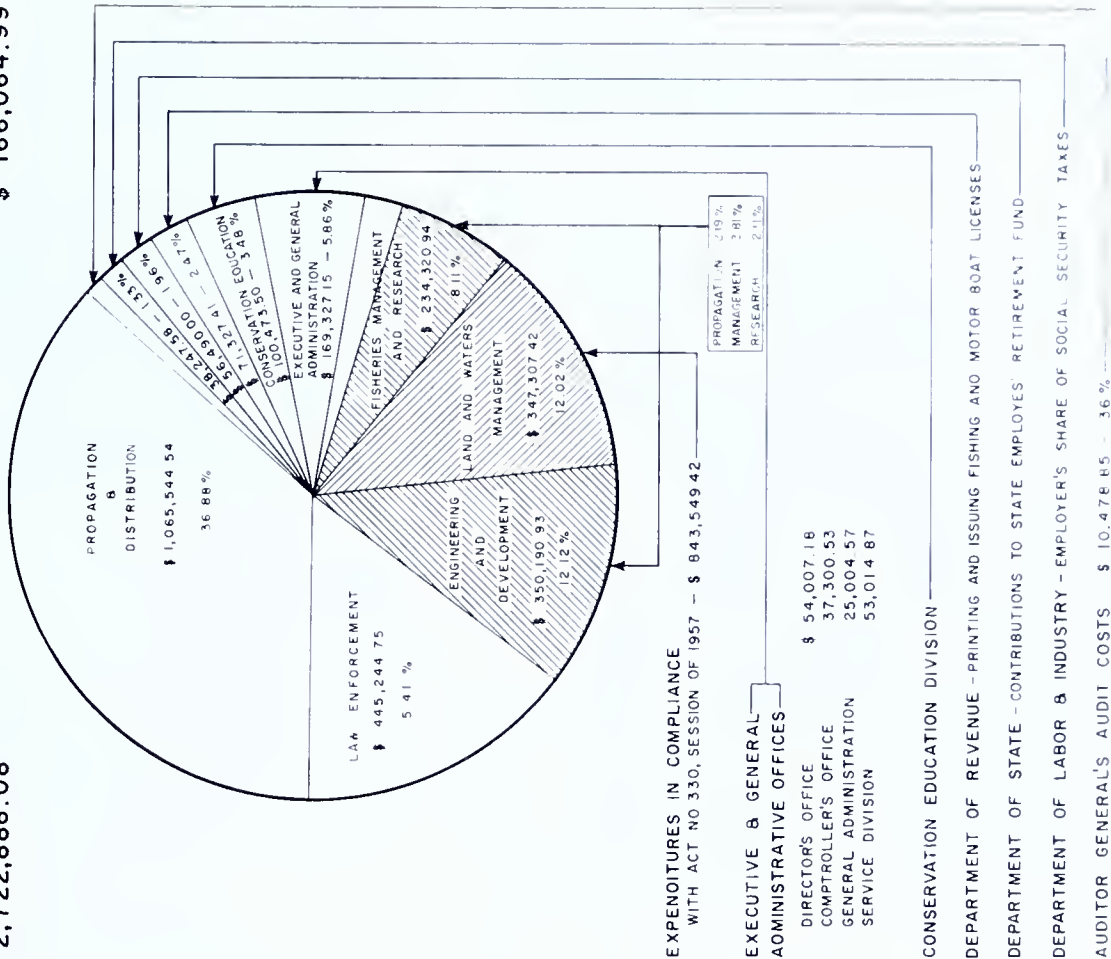
EXPENDITURES FOR THE FISCAL YEAR JUNE 1, 1960 TO MAY 31, 1961
TOTAL \$ 2,888,953.07

SPENT BY FISH COMMISSION

\$ 2,722,888.08

SPENT BY OTHER STATE DEPT'S

\$ 166,064.99



30th Anniversary - Pennsylvania Angler

The first issue of the PENNSYLVANIA ANGLER was born in George Neff's cellar on October 1, 1931. No offense to Mr. Neff, but from these lowly portals, the brain child of its first editor, Alex P. Sweigart, took form and substance to become the official state magazine of the Pennsylvania Fish Commission.

Neff, who later became purchasing agent for the Commission, mimeographed the "bulletin," as it was originally termed, in his cellar with an early hand crank, mimeograph machine. The first few months served a circulation of 4,000 copies . . . free! It increased later to 4,500 and in September 1933 reached 5,000 copies distribution. The covers of the early issues were printed in bulk at the Telegraph Press. Neff charged 75 cents per stencil, ran from 8 to 16 stenciled pages; charged \$1.00 per thousand additional to run, assemble, staple. His average charge was \$75 per month. These charges included free pick up and delivery, for after the magazine or "bulletin" was finally assembled, George had to deliver them to the Bureau of Documents in his personal car at no charge.

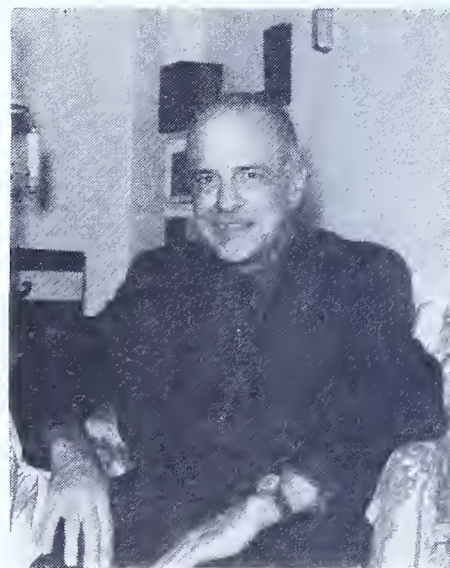
The mimeograph process gave way in October 1933 to the first printed issue that appeared in black and white, had 16 pages and was 9 x 12 inches in size. By then, the circulation had almost doubled and a charge of 10 cents per single copy or 50 cents per year was solicited to help pay costs of publication.

A two-color issue appeared in August 1934 of 16 pages, and a 3-color back cover was attempted in December 1934. The first use of full color on the cover was made with the May 1937 issue and through the years following, Fred Everett, beloved outdoor painter, did the art work for the ANGLER covers. Samples of his work can only meagerly be duplicated in black and white, cannot possibly show the brilliant colors from Mr. Everett's canvas.

Subscribers mourned the disappearance of these treasured covers when the last one was used in the February 1943 issue. World War II brought shortages of ink, paper and materials so necessary at the time for the war effort. The old black and white process was back again with an occasional burst of 2-color covers.

On down the years many styles of covers, articles, features, art styles have reflected the aims and thoughts of six editors, the graphic story told partly in the cover reproductions in this issue. Each issue of the ANGLER, from first to last represents, in its printed pages, thousands of plans, schemes, ideas, failures and a million worries to the magazine's succession of editors, advisors and contributors year after year . . . decade after decade . . . THIRTY YEARS!

The ANGLER has matured . . . it has never strayed from its position of simple, quiet dignity, clean, wholesome information and inspiration, and more, it has always expressed a courteous concern for all its readers no matter what creed, color or station in life. Mostly informal, unassuming . . . no winner of glorious prizes, literary or otherwise, it HAS directed its vigor, not in some meaningless mumbo-jumbo in the name of "conservation," but, to the slow, steady, solid and hearty contact with the fishermen of Pennsylvania via the printed word and picture. Thus . . . ANGLER and fisherman, together, have in some measure, learned the dogged, hard lesson of mutual restraint and understanding that largely influences and determines our actions outdoors as sportsmen and human beings.



ALEX P. SWEIGART
FIRST EDITOR

Those were great days, halcyon days (but what aren't, in retrospect), back there in the early 'thirties when the ANGLER "chipped through the shell." It was at a time when CCC roads were opening up many of the areas where the native brook trout still held sway. Gifford Pinchot, the "Old Forester" and, in your correspondent's memory the greatest caster with an "ounce or slightly better fly rod" of his day, was Governor. His Commissioner of Fisheries, Oliver M. ("Ollie") Deibler, was to start in those early days the Spring Creek Project near Bellefonte, Centre County, better known as "Fisherman's Paradise."



EDITOR CHARLES K. FOX

A great way for the angler to pass the time from one season to another is to read the experiences of others and to read about the species of fish of particular interest. Whether it is informative detail or armchair adventure, the dedicated fisherman enjoys all that is related to his favorite pastime. The more it can be applied to his fishing waters, the better he likes it. These are the reasons why the pages of the PENNSYLVANIA ANGLER are enjoyed and appreciated by the fishermen of the Keystone State.

An old rolltop desk and one typist-secretary proved to be the rallying point there in the South Office Building for the grandest group of practical fishermen this graying editor ever knew. For, you see, the first ANGLER was, first of all, a cooperative project. Without the support of the dedicated anglers who backed it with their contributions it would probably have never "sparked." There were Charlie Wetzel, dry fly expert and author; Fred Everett, nature artist supreme; Charlie Fox, Clay Peters, of Lykens; the late Lloyd E. ("Juniata") King, Harrisburg; and the late "Bob" McCafferty, of Hershey, to mention a few. That old rolltop became a veritable fishermen's "roundtable" as the magazine grew from a tiny mimeographed 4-page number on its birth date in 1931, to an illustrated 16-page or better number by 1942. Incidentally, the first mimeographed copies were given away by the Fish Commission but in short order the practice became too burdensome and the printed illustrated issues became a reality.

The ANGLER of the '30's and early '40's was blessed, too, by the four-color covers by Fred Everett and splendid aquatic insect articles by Charlie Wetzel whose booklet "The Art of Fly Tying" in 1936 became an instant hit with trout fishermen.

Yes, to your humble scribe, those years of the ANGLER's beginning and subsequent growth will always remain memory's "golden years." It was a privilege beyond compare to work with so many dedicated and devoted angler-conservationists.

It was a pleasant and satisfying experience to serve as Editor of the ANGLER. Certainly one met and corresponded with many kindred spirits, made new friends and indulged in an extra share of fishing conversation.

As the magazine enters its fourth decade of service, we wish it and its Editor all possible success.



EDITOR RICHARD M. WILLIAMSON

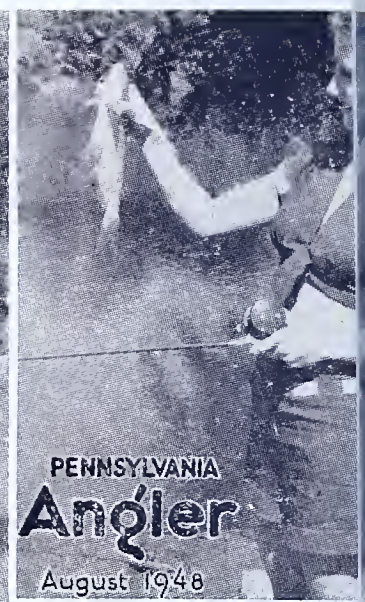
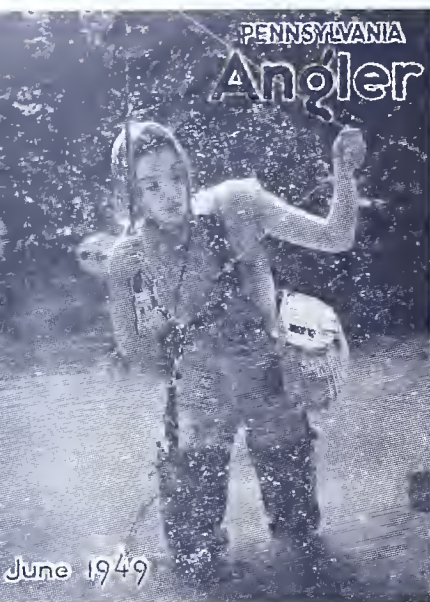
It was back in the winter of 1940, under the pen name of Dick Fortney, that I began writing a monthly column of fishing notes and tips for PENNSYLVANIA ANGLER. Little did I imagine at the time that some seven years later I would have the interesting and challenging experience of sitting in the editor's chair for an interim period of one year.

But that is what happened—and as a result I'm the only ex-editor of the ANGLER who did his job at long range.

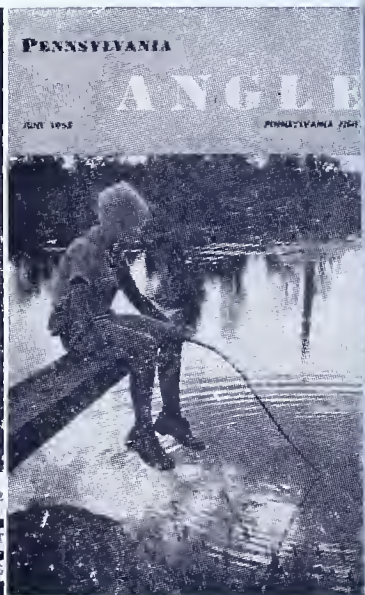
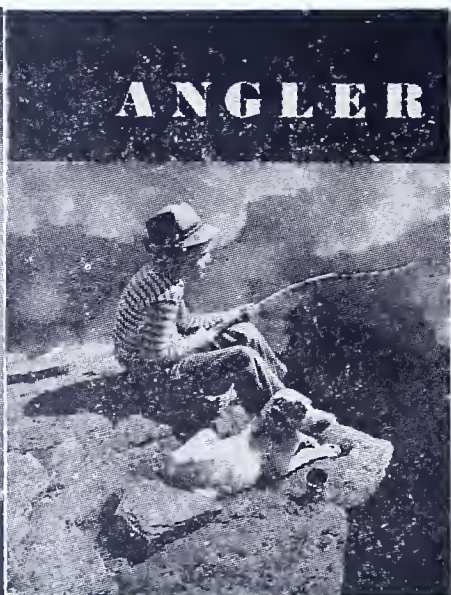
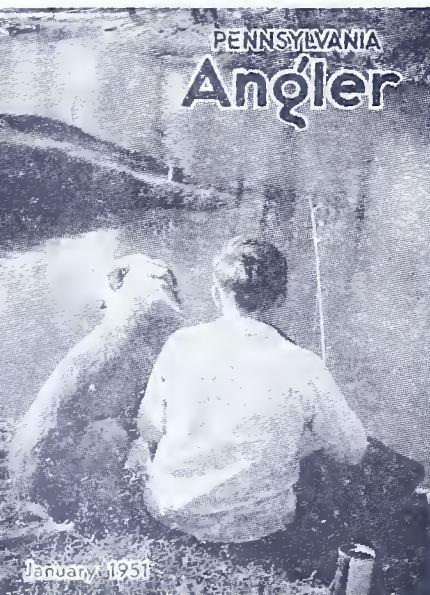
I did the editorial work—selecting manuscripts, editing copy, making up dummies, and reading proofs—at my home in Williamsport. The printing and distribution were handled from Harrisburg. The half-tone engravings and cartoons used as illustrations were made in Johnstown, and the articles that appeared in the ANGLER during my editorship were the work of outdoor writers scattered all the way from Cleveland to New York City, including many points in between.

My warmest memories of my year on the job are of the wholehearted cooperation of everyone concerned. I made frequent trips to Harrisburg to confer with headquarters personnel of the Fish Commission; I received letters of encouragement and frequent contributions from members of the commission. A secretary in the office of the commission was assigned to me, and a steady flow of correspondence kept me as close to headquarters as if I had been working in an office across the hall instead of in a city 85 miles away.

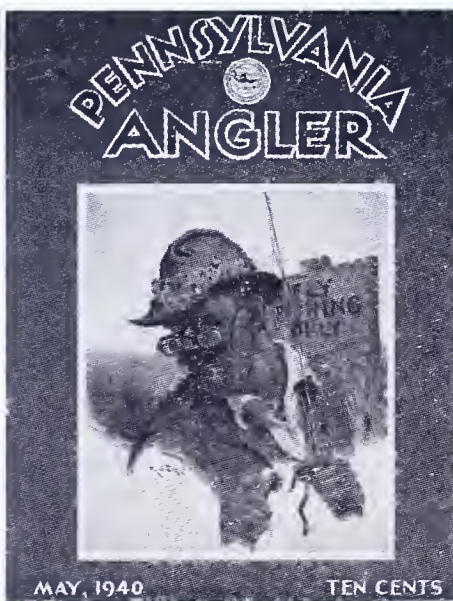
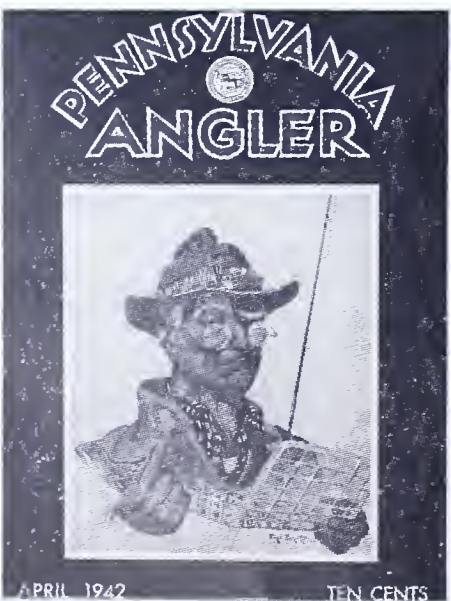
It certainly was a unique arrangement in magazine publishing.



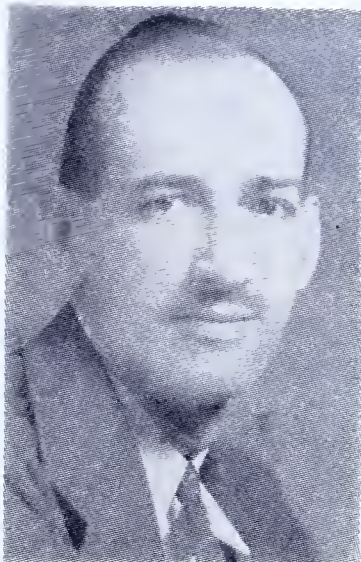
THE GIRLS...



THE BOYS...



THE OLD TIMERS...



EDITOR FRED E. STONE

When Dick Williamson resigned, Fred Stone was appointed editor by the Fish Commission, turned out his first edition in January 1948. He alternated the ANGLER desk with J. Allen Barrett until December 1950.



EDITOR EMERITUS J. ALLEN BARRETT

"On agin—off agin—in agin—finigin"—yes, that's just about how the editorship of the PENNSYLVANIA ANGLER fell in my lap on four separate and distinct occasions during my twenty years of service with the Pennsylvania Fish Commission.

Coming with the Fish Commission on October 1, 1940, I was assigned to the office of "educational lecturer," which job carried me all over the state preaching the gospel of conservation and appealing for public cooperation with the program and policies of the Commission. In September, 1944, the editor of the ANGLER up and quit and yours truly inherited the additional responsibility. I continued until July, 1946, when the services of a new editor were procured. This editor carried on for one and one-half years and then with the January, 1948, issue he resigned and I supervised and alternated with Fred Stone until December, 1950, when the present editor, George W. Forrest, took over. Mr. Forrest remained for five years and eight months, but with the October, 1956, issue, I again fell heir and edited the ANGLER until June, 1960, when Mr. Forrest returned to the top desk, which job he occupies at this writing.

Editing the PENNSYLVANIA ANGLER has not only been interesting, but also a very fascinating venture and I loved every minute of it.

I am confident that the present editor will continue to do a bang-up job and I herewith convey my warm best wishes upon this 30th anniversary of the magazine's publication.



EDITOR GEORGE FORREST

Present editor, took over paste pot with the January 1951 issue. His first hitch at the editor's desk ended with the September 1956 issue. During the interim the ANGLER was enriched by "regulars" . . . Charlie Wetzels, Charlie Fox, Nick Casillo, Thad Bukowski, Keith Schuyler, Dick Fortney, Al Shimmel, Don Shiner, Carsten Ahrens, Ellen Dietrich, Vince Marinaro, George Harvey, Hal Harrison, Joe Carricato, Brook Focht, Ralph Sides, Pete Busser, Bill Boyd, Bill Wolf, Jim Hayes, John Alden Knight, Richard Alden Knight, Joe Pancoast, Bill Walsh, Johnny Mock, Seth Myers, Alvin "Bus" Grove. Some nationally known writers . . . Al Clark, Howard Walden, II, Joe Bates, Jr., Mike Hudoba, Edwin Way Teale, Sparse Grey Hackle, Art Flick, Jim Gasque, John Terres, Willy Ley, Ben East, Ben Robinson, Gene Burns, George X. Sand, Erwin Bauer, Lee Wulff and Ray

Ovington. There were many, many more contributors of equal writing agility and fame. Some great photographs came from: Aubrey Bodine, Joseph Muench, Ormal Sprungman, Frank Floss, Bob Motter, W. T. Davidson, Don Shiner and others. Some of the nation's greatest fishing, outdoors cartoonists like Al Kauffman, Tom Blakely, Mel Millar, Alwyn Girod, Atkins and many others, were regular contributors in this era. After a long battle against illness, the present editor returned in May, 1960.

The Pennsylvania Angler

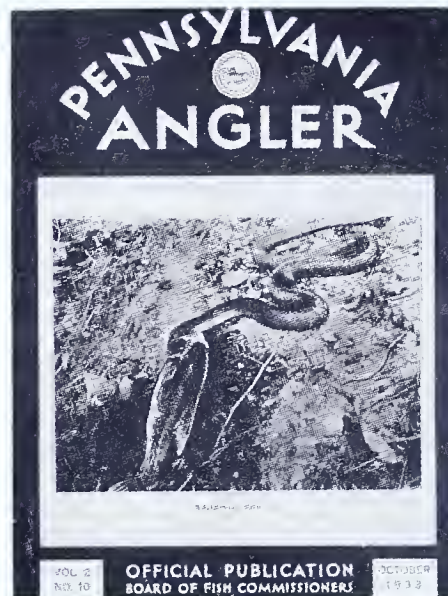
PENNSYLVANIA
ANGLER



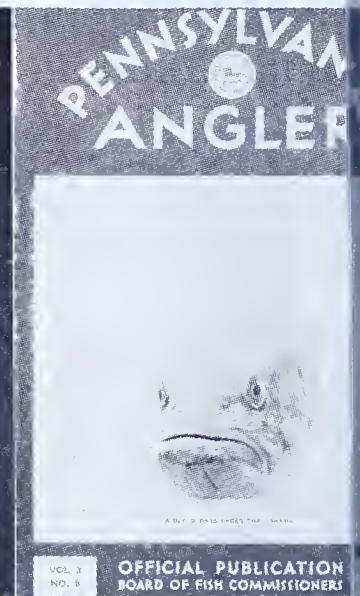
NEWS BULLETIN FOR
FISHERMEN
DECEMBER 1931



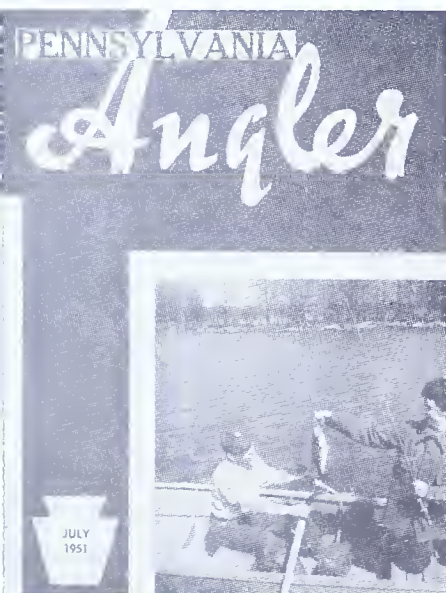
Early edition of the ANGLER, typical cover and back. They were mimeographed copies ranging from 4 to 16 pages; several covers were of blue stock, others in gold. Alex Sweigart edited these early issues. Distributed free.



First PRINTED copy of the ANGLER—October 1933. Ten cents a copy or 50 cents per year was solicited to cover printing costs. Cover was in black and white.



August '34 issue was first color cover of orange and black. Starey-eyed bass looked pugnacious, probably was.



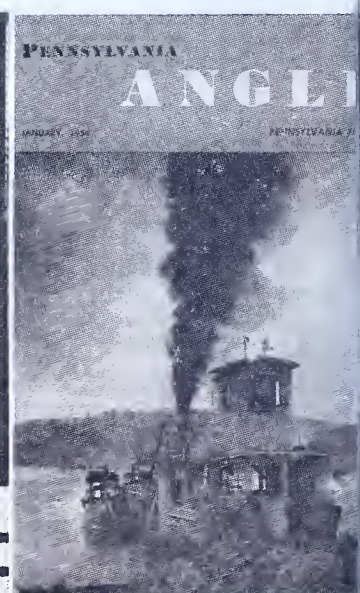
New cover design appeared in July 1951. Dark portions were in solid cover, masthead in white reverse.



Another design appeared in May 1952 very similar to that of Natural History Magazine of that era.

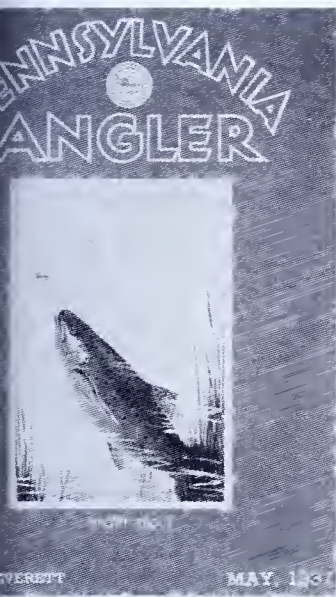


This design carried forward through 1953. One artist complained there were too many "lines" to suit him. Prize photos by W. T. Davidson later appeared in National Geographic.



Again, the mag change of mind, came up with this one styling which it kept over a period of 5 years, off and on.

Over Thirty Years



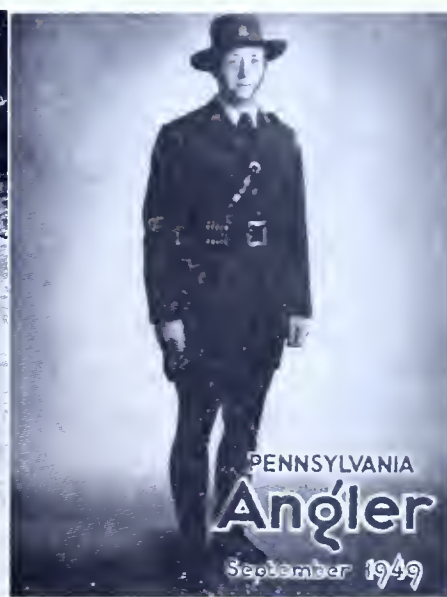
of the beautiful full color
s from the canvas of Fred
ett, noted outdoor painter.



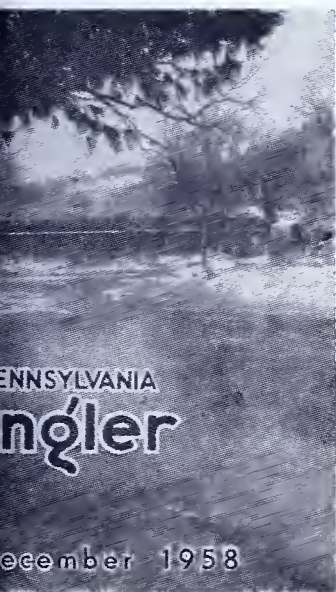
An example of Mr. Everett's
Christmas 1942 art, colorful in
brilliant reds and greens. Feb-
ruary, 1943, was last full color
cover as World War II short-
ages hurt.



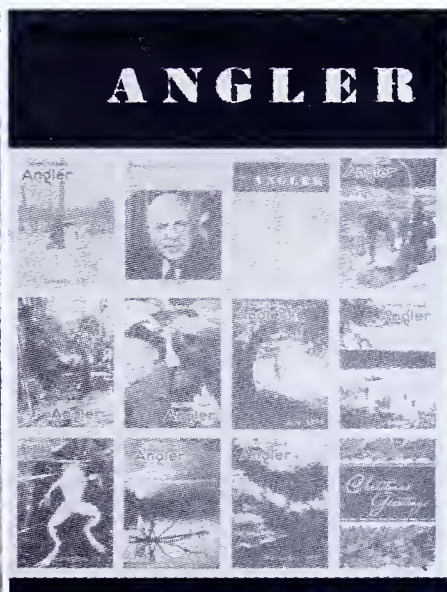
A new design for the October
1944 issue was a return to two-
color cover; legends in color
over black and white photo-
graph.



District Warden Kenneth Aley
in full uniform was the out-
standing cover man of that and
any other year. Handsome,
huh?



and then the old style
l come back from the
0 period. This 1958 De-
er issue was a nice,
massy green and white.



This yuletide issue of Decem-
ber 1959 brought forward the
year's series of covers in red
and green.



The 1960-61 covers carried no set style of mastheads, mostly a
combination of line drawings such as the one above by John
Taylor (Editor of Maryland Conservationist), and the fine photo-
graph by Johnny Nicklas, the Pennsylvania Fish Commission's
chief photographer.



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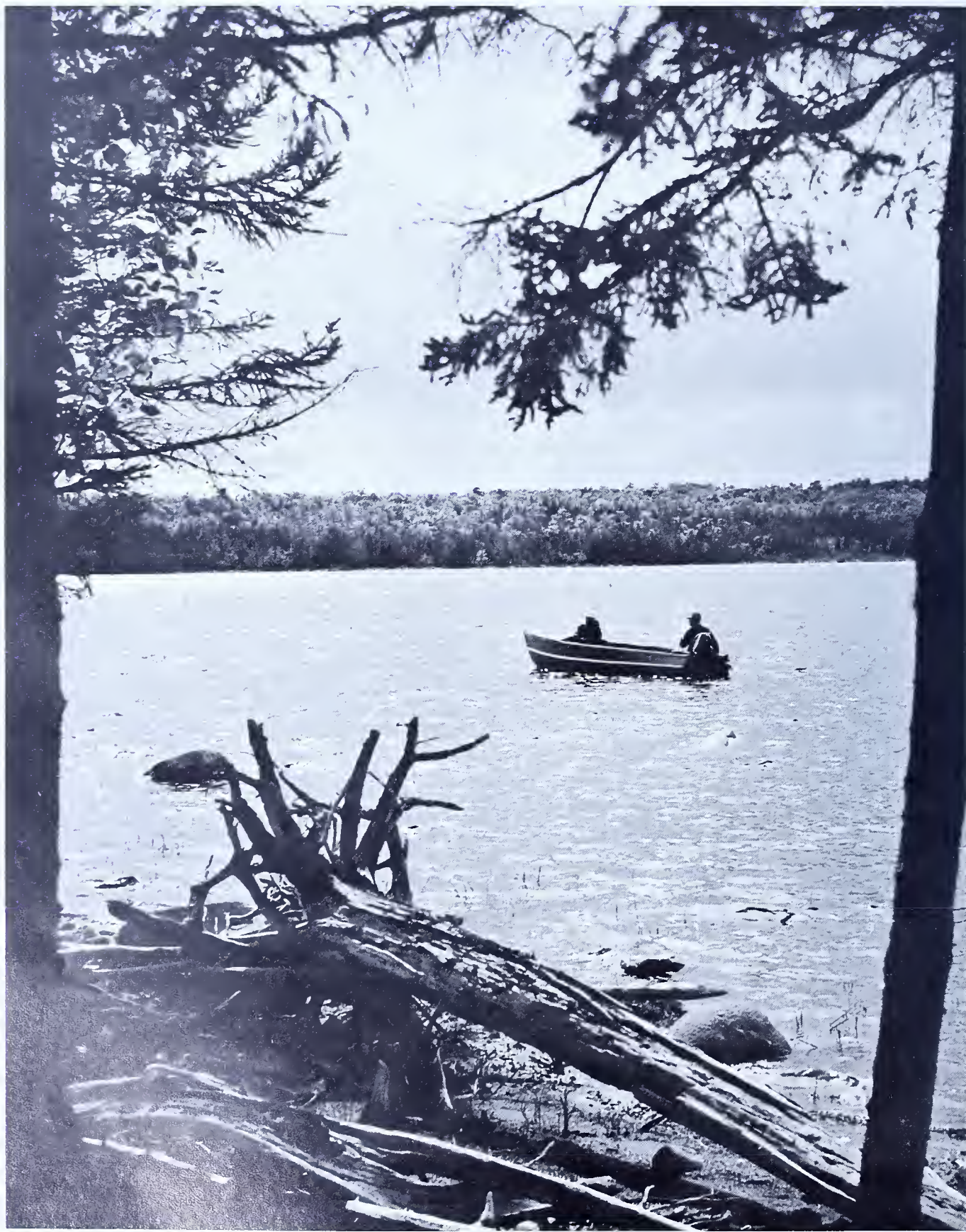
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Pennsylvania Angler



December 1961



Greetings of the Season
from the
Pennsylvania Fish Commission

FOR SAFER BOATING

By **ALBERT M. DAY**
Executive Director
Pennsylvania Fish Commission

Every state in the Union is having trouble satisfying the divergent interests that specialize in different types of water sports. Conflicts have grown apace. Speed boaters, water skiers and skin divers now crowd public waters which only a few years ago were frequented only by fishermen, bathers and picnickers. Administrative agencies catch the blame from all sides.

Pennsylvania is having its fair share of trouble. The Fish Commission has administered the boating laws since 1931 and this year received more complaints about speed boaters and water skiers than at any time in its history. Many fishermen have abandoned their favorite sport. Bathers and picnickers complain bitterly. There are demands in some quarters for definite zoning, either by area or by hours of the day.

The recently adjourned State Legislature considered two separate bills to more adequately meet the boating situation. Neither passed but the legislative thinking expressed is significant. Both bills sought greater control of the new cult of water frolickers in the interest of greater safety for all.

Senate Bill No. 210 sponsored by the Pennsylvania Pleasure Boating Association included in its provisions:—

“The board may make special or specific rules which may vary from locality to locality to meet local conditions for the regulation of water skiing and aquaplaning and in addition may require the presence of two adult persons in the towing vessel or a wide angle rear view mirror.”

House Bill No. 1258 sponsored by the Pennsylvania Federation of Sportsmen's Clubs said:—

“The operation of boats for water skiing or aquaplaning by persons under sixteen years of age is prohibited and is permitted for persons between their sixteenth and eighteenth birthdays only if they have the written consent of one of their parents or their legal guardian.

“No person shall operate or manipulate any boat, tow rope or other device by which the direction, speed or location of water skis, aquaplane or similar device

may be affected or controlled in such a way as to cause the water skis, aquaplane or similar device or any person thereon to collide with or strike against any object or person or in any way cause damage or injury to said object or person. No person shall violate any safety regulation which has been established by the board to protect persons or property.”

Considering these expressions of legal intent, even though no new boating law was enacted, the Pennsylvania Fish Commission at its meeting in Harrisburg on October 23 administratively moved to tighten the regulations on boating in the interest of greater safety for all. The new regulations will become effective on April 1, 1962.

They will require that persons under sixteen years of age operating a boat between the hours of 9:00 p.m. and 7:00 a.m., must be accompanied by a parent or guardian; they prohibit persons from sitting on the side or back of seats, on the bow of the boat or placing himself in any position other than the normal sitting position while the boat is in operation; they require that operators of boats pulling water skiers shall be at least sixteen years of age and have at least one other person sixteen years of age or older in the boat at all times; they prohibit the operation of motorboats at more than 8 miles per hour or at a speed too fast for safe conditions during the period from sunset to sunrise.

In adopting these regulations, the Commission was guided by advice from the nationally recognized boating authority—The Outboard Boating Club of America. A few pertinent recommendations from their brochure on a model pleasure boating act are:—

1. No motorboat towing water skiers should be operated from a period of one hour after sunset to one hour prior to sunrise.
2. They recommend that because of the speed necessary to tow a skier and the wide range of possible happenings during the course of the tow, two people should be in the boat so that

proper observation both fore and aft can be maintained at all times.

3. No person operating a motorboat 26 ft. or less should allow any person to ride or sit on either the gunwales or the decking over the bow while the boat is underway unless adequate guard rails or railings are included. They comment "a sudden turn of a craft or an unexpected swerve could put a passenger into the water . . . it is only common sense not to deliberately place oneself in a precarious position."

Their comments can well be summarized by the following quotes:

"THE OUTBOARD BOATING CLUB holds that no effort is too great when even a single life may be in jeopardy," and "No sympathy need be extended to anyone who goes to the extreme of endangering life, limb or property."

The Commission's action was influenced by some of the happenings on Pennsylvania waters during recent months. For example: A thirty-seven-year-old man standing back of the operator of a boat and holding on to the canvas top was thrown overboard and drowned when the operator made a quick turn. The man operating the boat did not even see the victim fall out. The body was not recovered for several days. The victim left a widow and a three-year-old daughter.

A forty-year-old man towing his nine-year-old son on skis in Lehigh County saw his boy fall and tried to retrieve him while still operating the boat. The father went overboard and was badly lacerated by the propeller. Another adult in the boat would have prevented this accident.

In Clinton County one person in a boat was towing a skier. The operator while watching the skier almost rammed a boat dock, made a quick turn to prevent colliding; upset the boat on top of himself and narrowly escaped with his life.

On Conneaut Lake a boat operating at about 22 miles per hour between 10:00 and 11:00 o'clock at night crashed into another boat. Both boats were damaged extensively and the occupants were exceedingly lucky that they survived.

Four other serious accidents which occurred on Conneaut Lake could have been prevented had the Commission's new regulations been in effect and observed.

So the story goes. It was with this background that the Commission moved toward establishing a safer boating era in Pennsylvania.

Pennsylvania Angler

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COMMONWEALTH OF PENNSYLVANIA

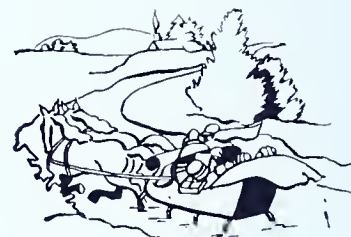
David L. Lawrence, Governor



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1961



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JOHNNY NICKLAS, Photographer

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Cover Art by Bob Cypher

Sketch of the Wise Men by Owen Penfield Fox

Cover photographs by Johnny Nicklas
Chief Photographer, Pennsylvania Fish Commission

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FISHING . . . INDIAN WAY

By
DON NEAL

OUR impressions of the Indian way of fishing, taken from accounts in school books and juvenile magazines mostly, were about as misleading as they could be and still have a spark of truth in them. For while in our mind's eye we picture the stoical Indian, spear in hand, patiently waiting for a fish to swim beneath his perch on an overhanging log; the truth is this method was only occasionally used by individuals who were perhaps having a little sport.

Actually, prior to the coming of the white men, when the Indians were in need of fish, great fish kills would be staged and enough would be taken by a joint effort of every Indian in the village to last a considerable time. By the use of brush nets in the initial stages of the "kill," and the employment of spears, clubs and small hand nets in the final step, huge quantities of fish would be provided in a day's fishing.

Their method of taking fish in their "fish kills" was not unsimilar to their method of taking game in their

"shake the bush drives" wherein the game was chased into a confined area where it could be slaughtered by the tribesmen with little effort, especially if enough men, women and children were on hand to prevent any large number of escapes. The major difference was that in the fishing a brush net was used instead of humans to round up the fish and push them into a confined area where the tribesmen could fall upon them with their spears and clubs, or scoop them up in small nets, and in their hands, and toss them out to willing helpers who lined the bank.

Because this was their method of fishing, the first consideration in locating an Indian village was a favorable formation of the river or stream at the selected spot. A long, deep eddy with a narrow outlet, or one that could be made narrow by the building of weirs, made brush-net fishing both easy and productive. If the eddy happened to be one with a deep run in its center, so that during periods of low water the span of the



be laid out on the streambank and the Indians were ready to fish. That is, they were ready to fish after anywhere from one to three days of dancing, feasting if there was plenty of food, and powwowing by the medicine men to insure the favor of the gods when the affair got under way. In the early days these were usually well controlled festivals of fun and neighborliness, but later often turned into drunken orgies with quantities of "firewater" considered a necessity. In fact, as "fish kills" approached their ultimate end the drinking liquor was usually furnished by white men who considered these activities as great sporting events and bribed their invitation to attend by supplying the drinks.

BUT with all of the delays there did come, finally, a day when the actual fish kill took place. It commenced with great pomp and ceremony as the Indians marched to the river's bank led by vividly painted medicine men who pounded on water-drums, and chieftains be-decked in their finest beaded costumes. Behind them came the lesser members of the tribe carrying spears, clubs and hand nets, with many of the women carrying woven willow baskets to contain the catch. Children romped ahead, in and out, and behind the procession and dogs trotted at its side. Highly enthused, a spirit of overall gaiety carried the marchers along, shouts and whoops drowning out the low vibrant sounds made by the water-drums.

At the river's bank the crowd disassembled. Half, usually the strongest men of the tribe, going to the net, the others going off downstream to take their places where the weirs narrowed the stream to a mere slit between the stone walls that had been built up. When all was in readiness the men at the net would swing it cross-stream at the head of the eddy and start dragging it, its top just above the stream's surface and its bottom bumping along on the stream bed, gradually working their way down stream towards the weirs.

As the net approached the weirs the excitement increased among the tribesmen assembled there. As it came the fish were driven, practically pushed, ahead of it until finally, with a sudden flurry, the driven

net could be lessened, it was so much the better.

However, in actual practice, when an established village got to be short of fish a call would be sent out to all villages in the area by its chieftain. Within a few days the Indians would gather and the making of the net would start. The men and boys would go off into the forests to gather grapevines and other tough and pliable materials, while the women would begin to plait these materials into rope-like strands that would eventually be woven into the net's body. Two long strands of extreme strength, their length determined by the width of the fishing area, were needed to form the towlines of the net, while usually hundreds of smaller strands were required to form its meshing.

FOR days the villagers and the visiting tribesmen would work at building the net, but these gatherings were social affairs, too, and unless the need for fish was immediate a large part of the time was spent with the men playing games, while the women chatted and loafed in the sun. Seldom if ever were they the industrious scenes we might imagine them to have been. For the Indian, both before and after the coming of the white man, had a widespread reputation of being slow and easy-going as though there was always plenty of time in an unhurried existence, except when faced with dire necessity.

Yet eventually the time would come when the net was finished, its strands woven together and well interlaced with brush and branches of hemlock, and it would





fish and the weapon-bearing Indians became one melee of twisting, flashing, striking fury. Fish were speared, clubbed to unconsciousness, scooped up in the small nets, or grabbed with the hands by women and children who wrestled their slippery prizes shoreward. Fish were tossed out to those who waited on the stream's banks, or were gathered in baskets by women who waded among the weapon wielders. When the net was brought close enough, it was swung up in a scooping manner and the Indians rushed to grab the fish that floundered on its matting of brush and hemlock boughs or were caught in its meshes of twisted vines. And such furious activity didn't take place without its full share of human casualties among the exuberant Indians.

Later, as the white man approached the Indian lands, the Indian was already learning his ways, horses were used to pull the towlines.

WITH the fishing done and the catch carried to the village a huge feast was prepared by the Indians. The "soft" fish were eaten immediately, while the "hard" fish were prepared for the smoking racks. And if the smoking racks were not filled to the satisfaction of the villagers other scoops with the brush net would be made until they were. Then the smoking fires would burn for days, with the village women tending to the curing fish.

The last "fish kill" to take place in Pennsylvania, and possibly the last to take place in the Eastern United States, was staged at Cornplanter Town (Warren County) just prior to World War I. Indians from the lower Allegheny Reservation along with the residents of the Cornplanter Grant were its participants, and although it ended in complete failure so far as the number of fish caught, and even brought on a brush with the Sheriff of Warren County, it ended as a great social event for the community.

The exact time is indefinite, for Indians pay little attention to such specific facts as times and places. But old-timers, some of them white men, remember the details and can place the time of its happening within a reasonably exact era.

At that time Cornplanter Town was a village of fair proportions, yet it boasted of only two things: its quarter-mile long boardwalk, and its all-Indian Silver Cornet Band. However, these two things gave it the status of being somewhat superior to any other village in the area. So it was natural this thriving village should send out invitations to a fish kill to which all its lesser neighbors came running. The last such event of its history was no exception.

The day the actual fish killing was to take place some two or three hundred visitors had arrived and were gathered on the lawn of the schoolhouse to listen to a short pre-action concert by the Silver Cornet Band. Later, they joined the procession making its way to the riverside, some of them even carrying spears and clubs, and they were as thrilled with the prospects of a day's sport as any of the town's citizens. But they were doomed to disappointment, for before the net could be placed in the water the sheriff arrived on the scene with an irate oil well operator who identified the steel cables that had been used to make the net as the ones someone had stolen from his oil lease a few days before. The operator claimed the cable, and the Sheriff claimed two suspected citizens of Cornplanter Town.

Today, Cornplanter Town is gone. So are the quarter-mile long boardwalk and the Silver Cornet Band. And gone, too, are the famous fish kills that once were the sport and support of Indian villages on the banks of the Allegheny River.



COOPERATIVE TROUT REARING NURSERIES in Pennsylvania

By **MERRILL LILLIE**, Superintendent
Pennsylvania Fish Commission State Fish Hatchery
Corry, Pa.

Pennsylvania Fish Commission Photos by Johnny Nicklas

IN PENNSYLVANIA, at the present time, there are forty-eight (48) cooperative trout rearing nurseries, operated by sportsmen's organizations in cooperation with the Pennsylvania Fish Commission.

The sportsmen's organization furnishes and constructs all rearing facilities at a location where there is an ample water supply of proper quality that has been tested and approved by the Fish Commission. Personnel from the Fish Commission advises the sportsmen's organization as to the proper type of pond construction, and the extent of development in accordance with the available water supply.

After the nursery development has been completed, it is again inspected by Fish Commission personnel and if found satisfactory, fingerling brook, brown or rainbow trout are supplied by Commission for stocking the ponds. The fingerlings are normally supplied for stocking the nurseries in May or early June of each year.

Fingerlings for stocking cooperative nurseries are supplied only after the Fish Commission has determined that the available supply of fingerlings is sufficient for this purpose after first stocking the ponds at the State owned hatcheries. However, at no time in the past has the supply of fingerlings been so low that the Fish Commission has not been able to meet the requirements of the cooperative nurseries. Approximately 420,000 fingerlings are stocked in cooperative nurseries annually.

Personnel from the Fish Commission meet with members of the sportsmen's organizations responsible for the operation of the nursery, furnishing them with all necessary information in connection with the proper feeding and care of the fingerlings. Also, all possible assistance is given should trouble or disease develop during the rearing period.

The cost of fish food and all other cost involved in the rearing of the fingerlings after delivery to the nursery, is the responsibility of the organization sponsoring the project.

The Fish Commission requires that all the fish produced at the cooperative nurseries be stocked only in streams that are open to public fishing. The stocking of trout produced in the cooperative nurseries usually



ST. MARYS SPORTSMEN'S CLUB installation at St. Marys, Pa., receives fingerling trout furnished by Pennsylvania Fish Commission's Corry hatchery in cooperative project. Wooden frame around, above ponds are covered to shade ponds in summer.

takes place when the fish are approximately sixteen (16) months of age or about ten to eleven months after the fingerlings were received at the nursery. Occasionally a limited number of trout are carried at the nursery one year longer to furnish larger trout for stocking purposes. However, the trout are normally stocked when they are from five to nine inches in length.

Annually the sponsoring organization is required to submit a report to the Fish Commission giving certain production records and listing the names of the public streams in which the fish were stocked. The District Fish Warden is usually present at the time stocking takes place.

Annual production reports covering cooperative nurseries have only been required beginning with the fingerlings supplied in 1960. From reports already received, it appears some organizations are having outstanding success while others have not fared so well. It is evident, however, the overall cooperative plan has developed into an interesting, worthwhile program via the efforts of sportsmen's groups in Pennsylvania.



BUCKTAIL ROD AND GUN CLUB club members at lower pond project, left to right, rear row, are: R. F. Williams, N. Osmanski, H. L. Johnson, J. J. Donovan and J. Zelenz. Front row: J. G. Zwald (Club Pres.), W. W. Herrick and G. A. Larson.



FOR STOCKING, the jeeps, time and gasoline are all contributed by club members.



TWO JEEPS with tanks installed ready for stocking. One tank aerates the water with the use of a gasoline engine, the other by means of several truck fuel pumps run by batteries. Standing are, left to right: W. W. Herrick, J. Zelenz, J. J. Donovan, L. V. Regelman and G. A. Larson. Kneeling are: N. Osmanski, J. G. Zwald, H. L. Johnson, R. A. Williams.

UPPER POND, Clear Creek, showing J. G. Zwald in the process of feeding the fish.



NETTED FISH ready for pails to be carried to the tanks in the jeeps. These fish range 5 to 7 inches.



PULLING SEINE for another haul are J. G. Zwald and G. A. Larson. Activity in the center of seine indicates healthy, active fish.



LOWER POND in Clear Creek.



STREAM IMPROVEMENT

By **RUSSELL S. ORR**, Chief
Conservation-Education Division

Pennsylvania Fish Commission Photographs by Glenn Hoy



LAYING LOG in stream for dam breast.

GENERAL VIEW of log dam after completion.



IF YOU think—you can.

That's the way Clair Carver and more than one hundred other sportsmen of the Unionville, Centre County, area looked at Wallace Run. The particular stretch of Wallace Run which attracted the interest of the members of the recently formed Unionville Rod and Gun Club is located in State Game Lands No. 103.

Years ago the stream had produced some good trout fishing, particularly after it had been improved by CCC boys in the '30's. The Unionville club sportsmen thought they could again improve the stream to produce good fishing, and the accompanying pictures show some of the results of their labors, as well as conditions before the improvement work started.

Some months ago plans for the improvement took definite shape when Centre County district fish warden, Paul Antolosky, attended one of the club meetings.

Early in September, a work party composed of the club members, Antolosky and the Commission's assistant photographer, Glenn Hoy, converged on Wallace Run. Jeeps and trucks, power saws, axes, shovels and picks and a midget bulldozer were put into action. The hard work of these sportsmen resulted in the improvement of more than a half mile of the tributary to Bald Eagle Creek. In all, a total of six log-type improvement devices and several stone dams were installed.

"Total cost to the club of this project designed to improve the future fishing potential on this stream was nothing financially, but it did involve a good bit of sweat and hard work," said Warden Antolosky.

"Many of the men expressed the satisfaction received

CLOSE-UP of completed log dam.



WALLACE RUN—Centre County

for their labors after viewing the completed devices. They knew they had assisted in creating better survival conditions for the fish that they would be hoping to catch next season."

A week after completion of the improvement structures, Antolosky visited the stream and found that every one of the pools created contained at least two trout.

The Fish Commission long has recognized the extreme importance of work of this kind which can be done by sportsmen's groups. In keeping with their determination to assist in the planning and development

of such projects, the Engineering and Conservation Education Divisions recently have prepared a "Stream Improvement Guide." The Guide includes plans and descriptions for thirteen types of stream improvement devices. All of these devices are designed so that with few exceptions, they can be built out of materials available along most streams, and most of them can be accomplished with a minimum amount of machinery.

Clubs and other groups interested in obtaining the "Stream Improvement Guide" can do so by writing to the Conservation Education Division, Pennsylvania Fish Commission, Harrisburg.



WALLACE RUN stream bed in original condition.



LAYING BOTTOM log of deflector.



DEFLECTOR nearing completion.



LOG-TYPE deflector completed.

The Age and Growth of

TROUT

in Pennsylvania

PART XII

By

KEEN BUSS and JACK MILLER

Fishery Biologists

Benner Spring Fish Research Station
Pennsylvania Fish Commission

Pennsylvania Fish Commission Photos by Johnny Nicklas



BROOK TROUT as large as they grow in a hatchery. This 21.7-inch, 6.3-pound fish was four years old.

by June of the second year. Spruce Creek is a fertile limestone stream meandering through the farm land of Huntingdon County. On the other hand, brown trout in Kettle Creek and Tionesta Creek in mountainous areas do not reach a legal size until September of the second year according to the data assembled by George B. Beyerle and Edwin L. Cooper of the Pennsylvania State University.

TABLE I

**The Average Length in Inches of Brown Trout
in Three Pennsylvania Streams**

	<i>First Year</i>				<i>Second Year</i>			
	<i>Mar.</i>	<i>June</i>	<i>Sept.</i>	<i>Dec.</i>	<i>Mar.</i>	<i>June</i>	<i>Sept.</i>	<i>Dec.</i>
Spruce Creek	1.0	2.0	4.2	---	4.5	6.6	7.6	8.5
Kettle Creek	---	1.2	3.4	3.9	---	4.7	6.4	7.0
Tionesta Creek	---	---	---	---	---	5.9	7.0	7.8

Brook trout growth is even more variable than brown trout. Some brook trout in high, densely shaded, head-water streams may run their life span without ever reaching 6 inches. In many cases, too many brook trout help to aggravate this condition of slow growth. Incidentally, four years is a ripe old age for brook trout although they have been reported as old as eight years from Adirondack Lakes.

There is little reproduction of rainbow trout in most Pennsylvania streams, but it does occur in south central portions of the state and in the tributaries of Lake Erie. A Commission Lake Erie biologist reports that rainbow trout produced from natural spawning average 3-5 inches the first year before entering the lake. Some trout returning to the tributaries from the lake at three years of age average 17-20 inches and five-year-old trout average 31-32 inches and one of these, a female, weighed 14 pounds. These fast growths result from adequate food and the better environment of Lake Erie.

The growth of trout in different hatcheries can be as variable as it is in streams. Limestone hatcheries with constant temperature water and good flow usually produce the faster growing trout. The figures for hatchery-produced trout in Table II are from trout held under ideal conditions and whose parents were

The data which have been accumulated on the age and growth of brook, brown and rainbow trout in Pennsylvania reveal great variations within the species. One of these variations is caused by seasonal fluctuations in the temperature of the water. Some streams are very cold in winter and have high temperatures in the summer. Since trout feed and grow best between 50 and 65°F. and have little or no growth below 40 and above 65°F., the growing season may be very short. Other streams, particularly limestone streams with big springs, have much less fluctuation in temperature and are neither too cold in winter nor too warm in summer for fast growth. Consequently there is some growth all year, but the most rapid growth occurs in the spring when temperatures are ideal and insect populations are at their highest levels. The growth of the trout and the size of the insect population is also related to the fertility of the streams. For instance in Table I, brown trout reach the legal limit of six inches in Spruce Creek

selected for early spawning and fast growth. These figures are not applicable to all hatcheries. A few private hatcheries in poorer locations must hold their trout for two years to reach 8 to 10 inches.

TABLE II

Average Length in Inches of Production Trout
at Benner Spring Fish Research Station

Species	First Year		Second Year	
	June	Sept.	Dec.	March
Brown trout	2.8	5.0	7.8	8.5
Brook trout	3.5	6.2	8.0	8.8
Rainbow trout	5.0	7.8	10.5	11.2

Trout are usually shipped as yearlings in March from most of the state hatcheries. The data in Table II are for yearling fish but these are averages. Actually yearling trout, if left ungraded, may range from 3 to 16 inches. Over a three-year period, 58 per cent of the trout planted were 8 to 12 inches. The other 42 per cent were made up of the fish that did not reach 8 inches and the fish which outgrew their brethren and occasionally reached a maximum of 15 to 17 inches. Remember growth such as this results from ideal environmental conditions, good care and the constant availability of a balanced diet.

The question often arises, "What is the maximum growth that can be expected from these three species of trout?" Table III shows the results of selecting the fastest growers and maintaining them over a period of years. This can be considered maximum growth for a limestone hatchery in an area similar to the location of the Benner Spring Fish Research Station.

TABLE III

Average Length in Inches of Selected Female
Hatchery Brood Trout

Species	Age in Years						
	1	2	3	4	5	6	7
Brown trout	14.5	20.7	26.3	28.2	28.6		
Brook trout	13.1	17.0	18.7				
Rainbow trout	18.2	20.6	25.4	28.2	28.8	29.0	

If you are still looking for better growth, it can be found in new introductions such as the rainbow trout planted in Lake Pend Oreille, Idaho, where two new world records were established with 4-year-old fish. One weighed 37 pounds and the other 36 pounds. Comparative growth is attained when rainbow and brown trout were introduced in the southern hemisphere, notably in South America, New Zealand and Australia.

It should be quite obvious that trout growth in Pennsylvania as well as in the rest of the world is quite variable. Any "rule of thumb" law is quite inadequate unless one denotes a specific water area.

Izaak Walton said, "... and certainly, as some pastures breed larger sheep so do some rivers, by reason of the ground over which they run, breed larger trout."



RAINBOW TROUT which mature in Lake Erie grow large. George Kuhns caught these two lake-run beauties, a 24-incher on the left and a 30-inch, 12-pounder on the right.

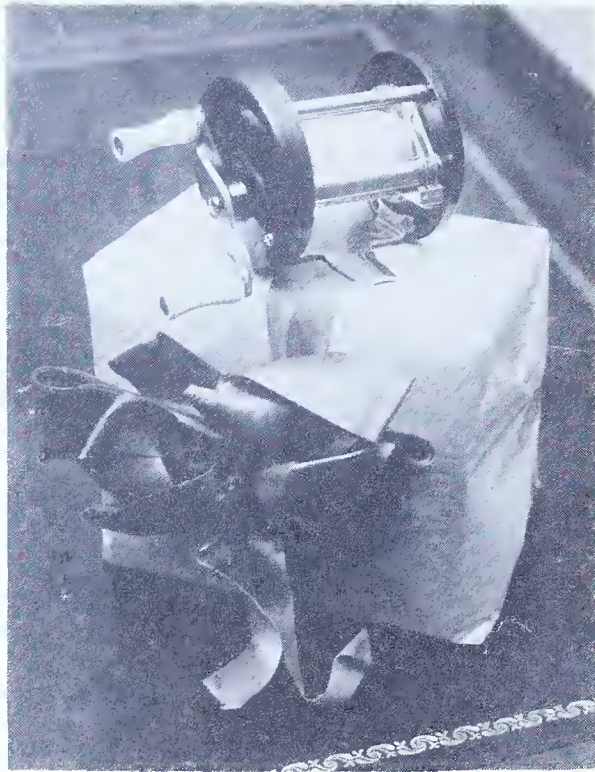


SMALL "MOUNTAIN" BROOK TROUT. These barely legal fish were in their third and fourth summers of growth.

This is the fisherman's clue today as it was over 300 years ago. If he is after large trout, he must fish the larger, more fertile streams.

This is what we were trying to say throughout this entire narrative and old Ike said it in a portion of a sentence.

A Christmas Present for Dad...



THIS IS IT! This is a private sneak preview of Dad's Christmas present.



UH . . . OH! A pair of beady little eyes appear.



GEE! . . . a guy could hang himself!



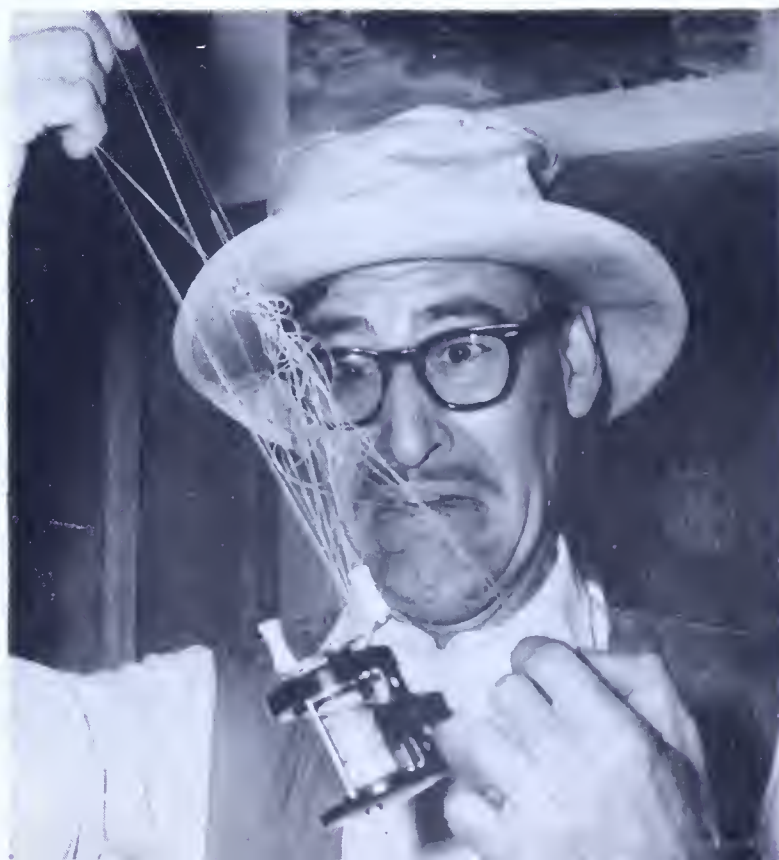
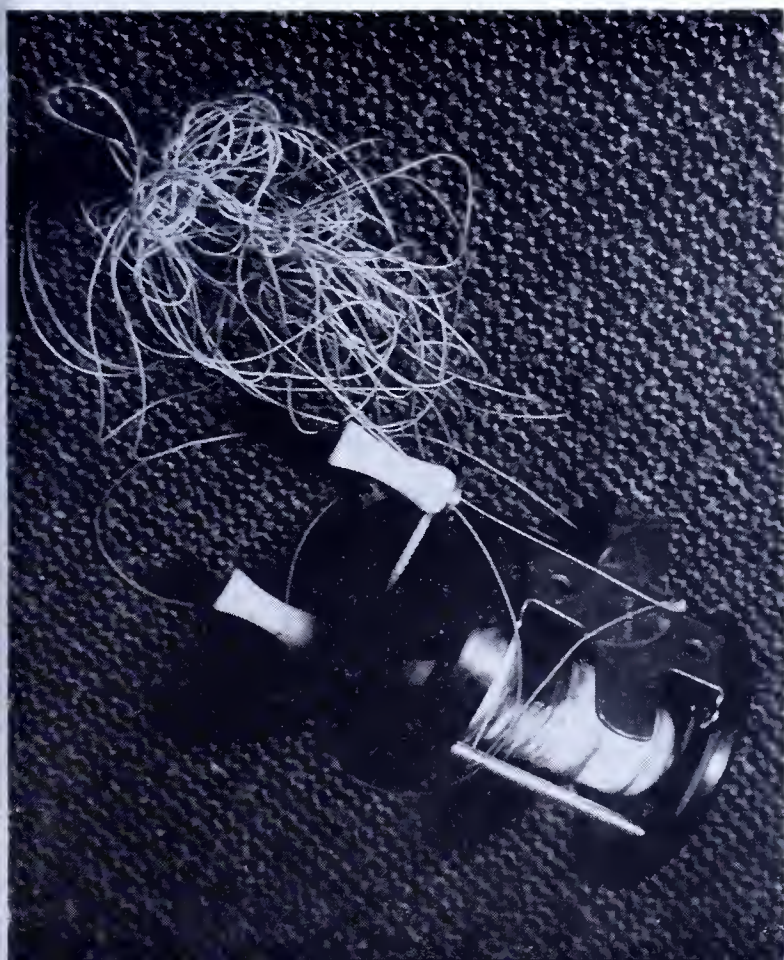
SOMEBODY COMIN'! . . . better get rid of this whirlygig.



What in the Billy-be-jabers is this thing . . . anyhow?



BOY! . . . I don't know what it is . . . but it's some fun!





DEMONSTRATIONS of electro-fishing were presented to teachers at State Conservation Workshops by Harold Corbin, Regional Warden Supervisor, and J. Curtis Simes, Regional Fishery Manager of the Pennsylvania Fish Commission. Also assisting was District Warden, Richard Owens.

Fish Commission Assists State Conservation Workshops

By **RUSSELL S. ORR**, Chief
Conservation-Education Division

County school administrators and teachers have been responding very favorably to a series of conservation education workshops being held throughout the Commonwealth. The workshops have been held under the auspices of the Department of Public Instruction. Mrs. Eleanor Bennett, research specialist on conservation projects, has been in charge of the arrangements for the workshops.

The Pennsylvania Fish Commission has cooperated with other conservation agencies of the Commonwealth in presenting the program at these sessions. Other agencies participating include the Game Commission, Department of Forests and Waters, State Soil Conservation Commission, and the Geologic Survey of the Department of Internal Affairs.

The workshops in some cases are one-day affairs, while others last for several days.

Commission personnel recently participated in the Mifflin County Conservation Field Day, which attracted more than 400 teachers and teacher trainees. The Commission was represented by the chief of its Conservation Education Division, who spoke to the group, giving a brief description of Commission activities. He also presented each teacher who attended with a packet which included the various conservation education publications prepared by the division.

Biological aspects of the Commission activities, including an electro-fishing demonstration, were presented by regional fishery manager, J. Curtis Simes, of Huntingdon. Regional warden supervisor, Harold Corbin, and district warden, Richard Owens, assisted Simes.

The Swamp Boat

The fellow standing in the stern of the boat referred to our craft as a "mud scow." I called it a swamp boat. But whatever the name, it is one of the finest crafts I have ever encountered for skimming over tree limbs, beds of lilies and pickerel weeds, and, in fact, for gliding over practically everything that is lubricated with moisture! Across water or "wet land," this boat handles with amazing ease.

Here, I thought, was the perfect boat for fishermen who like to visit a secretive marsh or beaver pond for catties, pickerel, and the occasional pot bellied bass. The sled runner bow literally climbs over the vegetation and mud bogs in this type water. Yet it handles equally well on open ponds.

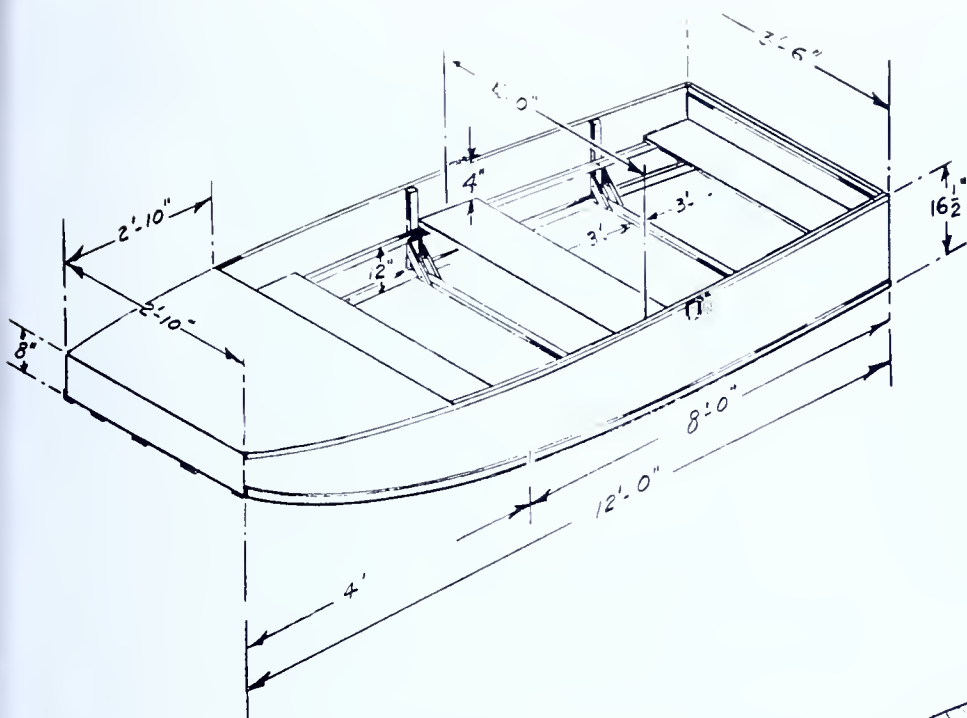
When I was a grasshopper-high youngster, Dad and I frequently staged visits to a swampy, beaver pond to angle for big yellow belly cats. By carrying boards on our shoulders each time we hiked to the marsh, we soon acquired enough material to build a rectangular box-type scow for plowing across and around the bogs that were thick with huckleberry brush. Many a gallon of kerosene was burned in our lantern to light, though dimly, our bobbers. Trouble, however, always loomed its ugly head whenever our floating box rammed a half submerged bog. The whole adventure now reeks with nostalgia, and I long to hear again the ringing song of those particular red-wing blackbirds, to pole that old scow across the fog shrouded marsh and to heave the whiskered cats aboard the floating box. The marsh is now a duck preserve. Wish then, Dad and that barefoot youngster had this modern sled-runner scow!

The gracefully upturned bow, the wide flat bottom, and the sizable decking are all features of a good functional design boat. For example, the sled-shaped bow plows over mud bars and bogs, submerged logs, and, as said before, practically everything lubricated with water. The wide, flat bottom, constructed of one piece plywood, gives an extremely shallow draft, even when the craft carries three fishermen and their gear. The wide, stable deck is suitable for an angler to curl up and relax; serves as a galley for the camp stove when preparing coffee or ham and eggs; a platform for a tripod and camera when filming wildlife; a platform for a duck blind, or a place for the lantern during an all-night cat session. This boat, weird as it may appear, will serve well the angler, or the outdoor enthusiast.

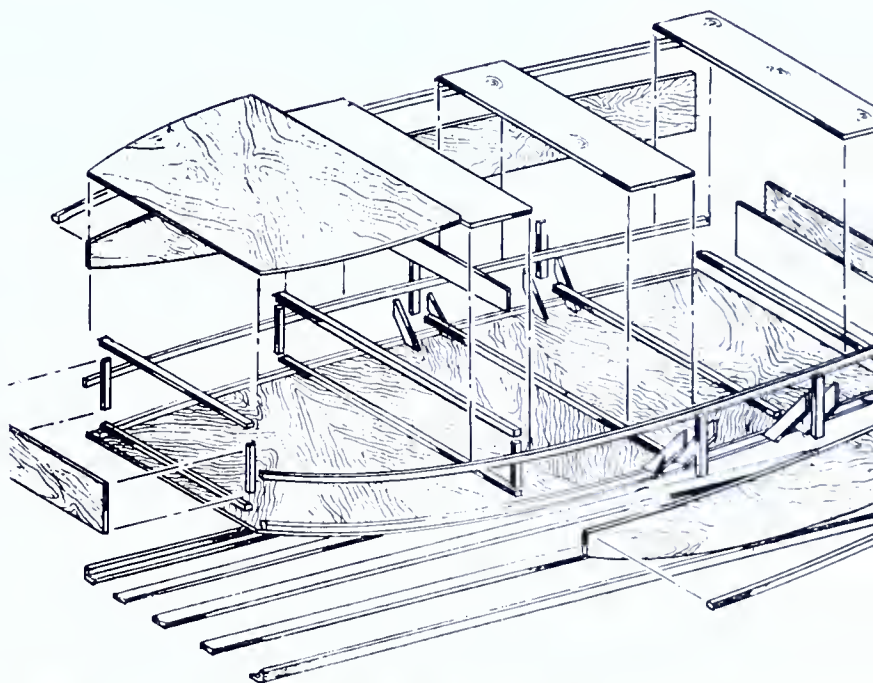
For those lucky anglers who know of a little beaver pond or marsh that is filled with fat mud cats, and where they can escape for a few hours from the problems and complexities of the cold war period, this is a dream boat. I suggest that you glance over the plans and dimensional sketches found on this page. Then, perhaps in moments of leisure, you may like to "carpenter" this little craft.

Tackle Tips

By DON SHINER



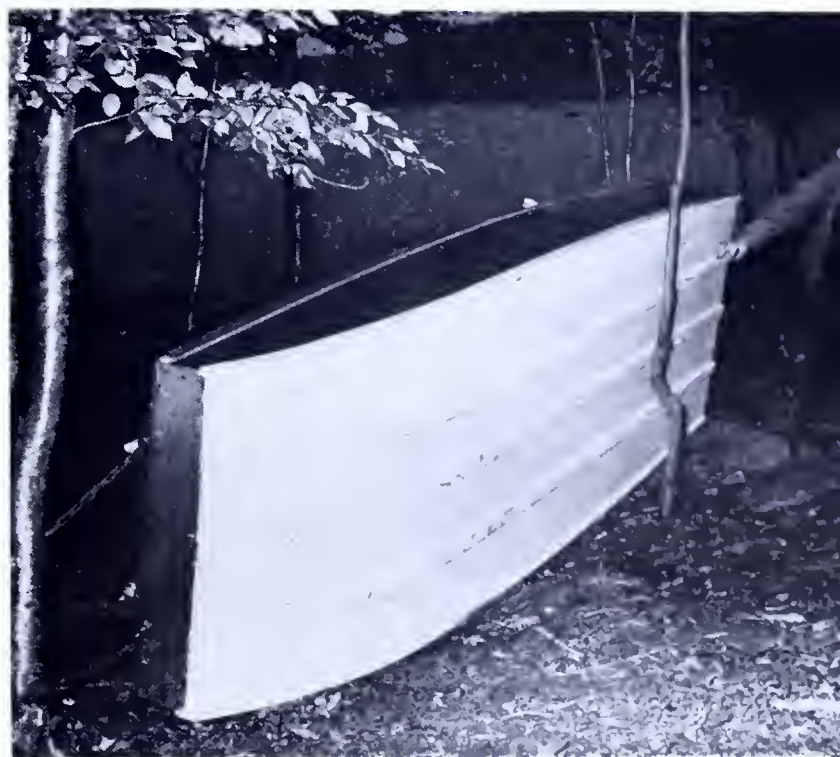
DIMENSIONAL sketch of the swamp boat.



EXPLODED sketch-view to show assembly.



WIDE BOTTOM is ideal for shallow ponds.



SLED RUNNERS on bottom protect thin plywood floor. Wide deck is perfect for lantern, camp stove, duck blind, or camera support for filming wildlife.

Boating



For Winter Reading . . .

People nowadays figure you haven't got much "status" unless you have two cars in every garage and at least one boat and trailer in every driveway or carport. Whatever YOU may think, the family boat is rapidly becoming as much a symbol of fun in the outdoors as the modern sports car.

Along about now the boating season is stowed away for another year but luckily, we boaters can still dream and read. In *FAMILY BOATING*, a book recently published by Arco Publishing Company, Inc., 480 Lexington Avenue, New York 17, N. Y. (\$2.50 to Arco or local book dealer), you get a real family glance at the real enjoyment common to all who float anything from a "tub" to a big, coastal power cruiser.

Authors Lillian Borgeson and Jack Speirs, long-time experts in the boating field, have written this 144-page book slanting it directly to the desires, information and advice for family skippers. Chapters include: Family Demonstration Run—tells you how to test a craft before purchase; Compact Cruisers; One Hull or Two; Houseboats are Big—how many of you out there in boatland always wanted adventure on a houseboat a la Mark Twain era? Kit Boats; Facts about Flotation; Motors and Controls; Make It Plane Faster, Quicker; Wind, Weather, Water; The Marina Pinch; Family Cruising; Accessories Make It a Family Boat; plus a handy Manufacturers' Directory on final pages.

I personally do not see how in the dickens the writers have crammed so much information in so little space. If some people had to write it, thrice its present thickness would hardly suffice. What a Christmas gift to cover the entire family of boating enthusiasts at one fell swoop!

Boating Quiz

Now that the summer boating season is over it may be a good idea to spend a few minutes in reviewing your general boating knowledge. The true and false quiz appearing below covers many phases of boating. If you can answer all of the questions correctly, consider yourself somewhat of a nautical expert. If you miss two or more you could probably stand a little brushing up.

The United States Power Squadrons and the Coast Guard Auxiliary offer courses in seamanship from time to time. In addition to these classes, you can learn more about boating by reading a few of the many excellent books written on the subject. Boating has grown fast in the last few years and there may be some new ideas you are not familiar with.

Give the quiz a try. A perfect score makes you an admiral; one wrong may still qualify you as a captain; if you miss two you're probably an able-bodied seaman but three wrong washes you out and sends you back to boot camp for further training. Good luck!

1. Reversing the motor and accelerating briefly will usually free a propeller of weeds.
2. When docking a boat at a pier, approach into the wind or current.
3. Starboard refers to the left side of a boat when looking toward the bow.
4. Poor idling is often a sign of defective spark plugs.
5. When pulling two water skiers, one rope should be shorter than the other.
6. When a barometer falls rapidly, be alert for foul weather.
7. A safety chain is used to secure a boat to a trailer.
8. Marine growth, such as barnacles and scum, have little effect on boat speed.
9. You can be held responsible for damage caused by the wake shown by your boat.
10. A boat leaving a dock has the right of way.
11. A skin diver's flag is red with a white diagonal stripe.
12. The water skiing flag is white with a red diagonal stripe flanked by a pair of red water skis.
13. Excessive vibration may be caused by a bent or broken propeller.
14. A bilge pump is used to inflate air mattresses.
15. A knot is a measure of speed rather than distance.

Answers: (1) True; (2) True; (3) False; (4) True; (5) False; (6) True; (7) False; (8) False; (9) True; (10) False; (11) True; (12) True; (13) True; (14) False; (15) True.

River Safety Patrol Organized at Clearfield



RIVER SAFETY PATROL members in one of two boats used to encourage boaters and water skiers to follow water safety rules on river at Clearfield. Standing on dock are Donald Rowles (left) and Russell Shaw (right). In boat, left to right, are Gus Chelgren, Donald Ham, Eugene Imler and Victor Hollopeter, who is in charge of the group sponsored by the Outdoor Boating Club.

Members of the Outboard Boating Club of Clearfield have organized a River Safety Patrol.

Prompted by the increasing number of motor boaters and water skiers on the river this year, the boating club has organized the patrol to help insure the safety of those using the river.

Charles D. Ogden, secretary of the boating club, said the patrol, in charge of Victor Hollopeter, is on duty weekends, when traffic is heaviest, and in the evenings during the week.

The Outboard Boating Club has drawn up a set of safety regulations which the patrol will enforce at all times. These regulations, which are posted near the club's dock in Lower Witmer Park, were approved by Warden Lester C. Ogden of the Pennsylvania Fish Commission, which has jurisdiction over river activities.

Members of the River Safety Patrol are Mr. Hollopeter, Donald Rowles, Russell Shaw, Gus Chelgren, Donald Ham, Hershel Wagner and Eugene Imler. They operate two boats while on duty and wear armbands which identify them as members of the patrol.

The boating club has said it does not want the patrol to be thought of as a law enforcement group, but rather as an organization which is interested in making boating more safe and pleasant for area residents.

Here are the safety regulations which the club has adopted and posted near its dock in Lower Witmer Park:

1. There will be no skiing after sundown. There will be two persons in boat at all times while pulling skier.
2. There will be no skiing or swimming permitted from boat dock at any time.

3. There will be no loitering on dock at any time, which is to be used for loading and unloading only.

4. Skiing within 50 feet of dock is not permitted.

5. All boats are required to have running lights which shall be in operation one hour after sundown, excluding canoes and rowboats which shall display a white light visible to all points of the compass.

6. All boats shall be required to be equipped with coast guard-approved life preservers for each passenger.

7. Boating traffic pattern shall be as on all highways—boats on right of river, except to pass. Underpass of bridges will be made on right side of river.

8. All craft shall be operated in careful manner, maintaining a proper distance at all times with other craft.

9. There will be no careless operation of any craft at any time that may endanger other craft or lives of others.

10. All craft to the right shall have the right-of-way at all times.

11. Be sure you know all rules and regulations you received with your motor boat license.

12. Please park all boat trailers in paved area.

The River Safety Patrol and the dock in Lower Witmer Park are among the many services which the Outboard Boating Club provides for boaters.

This year the club donated \$200 toward the construction of the dam on the river and helped put finishing touches on the dam after it was constructed by the borough crew. Members have installed a landing structure where boats can be tied and have also put sandbags on the dam to raise the river level when the water was low.

Retired Wardens



LeROY E. NOLL, of Peckville, Pa., was appointed to the warden force on April 15, 1928. He was educated in Shamokin, Pa., public schools, was employed in the textile mills of that area. On January 23, 1917, he joined the U. S. Marines, served until April 14, 1921. During the period of 1929 to 1956, he was enforcement officer at Pleasant Mount hatchery of the Fish Commission. At the time of retirement he was District Warden for Lackawanna County.



HORACE A. PYLE, of Coatesville, Pa., became a fish warden on July 2, 1935. He was educated in Coatesville public schools following which he was an acetylene burner. As District Warden of Chester and Delaware Counties, Mr. Pyle made many friends, was very active among the sportsmen of his area.

The PENNSYLVANIA ANGLER pays tribute to these honored wardens for their many years of faithful service to the Pennsylvania Fish Commission and the sportsmen of Pennsylvania.

"And this is angling: a sport that requires as much enthusiasm as poetry, as much patience as mathematics, and as much caution as housebreaking."

—James Rennie, "Alphabet of Scientific Angling, 1833"

Notes . . .

from the Streams

Recent survey made by **District Warden Anthony Lech** in Schuylkill County waters indicated a cosmopolitan cross-section of out-of-state anglers fishing local streams. Those purchasing a nonresident or 5-day tourist license included fishermen from New York, New Jersey, Maryland, Delaware, California, Ohio, Kentucky, Connecticut, North Carolina, Indiana, Texas, Virginia, West Virginia, and Nebraska.

#

District Warden Kenneth Aley (Potter) has a first to his credit. While patrolling Lyman Lake he noticed an over-sized beaver. On closer inspection it turned out to be Mother beaver giving Junior a swimming lesson, carrying the youngster piggyback.

#

District Warden Lloyd Wilson reports a total of 6 legal muskies taken from Bald Eagle Creek's Flemington section during the past six weeks. The fish ranged from 31½ to 41 inches, maximum of 15½ pounds. Scale samples read at the Fish Commission's research laboratories show these fish had been of legal size for a period of at least 2 years. Wilson predicted good late season musky fishing.

#

When the Susquehanna River was in good shape above Hallstead, according to **District Warden G. Max Noll** (Susquehanna), bass were plentiful and of good size, one 19-incher checked of fine girth. A few eels taken in the area.

#

Regional Warden Supervisor S. Carlyle Sheldon declares the 1961 season best in recent years in Northwestern Pennsylvania. Lakes and streams have not been seriously affected by low waters or high temperatures. Periodic rainfall has kept water levels up, temperatures down. Trout fishing was better in late spring but few anglers took advantage of it. Walleye fishing at Pymatuning lasted about six weeks in May and June, catches were excellent. Musky fishing has been consistently good throughout the summer; perch, bass, walleye catches above normal in Lake Erie. Big lake perch are now moving into Presque Isle Bay at Erie and, if we get good ice, we can expect a banner year for ice fishing.

#

District Warden Kenneth Corey (Warren) says frost and chilly weather bring out a class of anglers seldom seen during summer season. This hardy fraternity only commences to fish after pickerel start hitting. They'll stay with it until weather gets so rough, the dogs go for cover.

#

District Warden Clifton Iman (Butler-Beaver), while patrolling Glade Run Lake recently, checked a Mr. Hedsell, of Pittsburgh, Pa., who reported taking 9 northern pike, ranging from 22 to 29 inches, from the lake in September using minnows for bait.

#

Sherman Ferguson plus two fellow anglers from Greenville, Pa., caught over 200 catfish at Pymatuning Lake recently in a 3-week period. **District Warden Raymond Hoover** (Crawford) figures if fishermen will fish for the species biting instead of waiting it out for a favorite, they can catch some fish. It's real hard to beat a nice mess of catfish for a fish fry! Warden Hoover also reported fine catches of bluegills in Conneaut Lake on grasshoppers and crickets.

THEORY has it 1,000 hours of fishing are necessary to catch a musky. Some fellow, I just call Mike, all of 68 years old, comes along and asks me for a good musky spot in Bald Eagle Creek. I helped him as best I could. The following day he fished about four hours at the spot . . . no musky, but . . . three fair-sized bass. Two days later, same spot, two casts plastered a 35-inch, 11½-pound musky. He called me immediately on the phone. . . . "Hey, Warden, know of any more of these big fish you want caught?" I guess some fellows never heard of theories or statistics . . . they just go fishing.

—**District Warden Paul Antolosky** (Centre)

#

JON R. MARK, secretary, Raystown Ski Club, wrote **District Warden Richard Owens** recently thanking him for Fish Commission help with their annual Ski Show. Handling a horde of boats on Raystown Dam and Branch is a big job these days and getting bigger as the club affair grows.

#

WHAT does a Warden do on his vacation? Well, a bus driver might go for a ride; a mailman might go for a walk, but **District Warden Lester Ogden** (Clearfield) went fishing. Caught something, too! A 27½-inch, 8-pound walleye in the North Branch of the Susquehanna River.

#

The Allegheny River was very low and clear and while on boat patrols, from vicinity of Trunkyleville to Oil City, **Warden Clarence Shearer** (Venango) and I glimpsed many fish including several big muskies. In one hole below the West Hickory Bridge (Forest), we saw at least 75 walleye ranging from 12 to 20 inches.—**District Warden Norman Blum** (Forest-Clarion).

#

Ted Janosik, Waterford, Pa., had to be coaxed, teased and threatened before he finally went fishing with his brother, Joe. They went fishing for muskies at Canadohta Lake. After about 10 minutes Ted hooked, played and landed a 9-pound 'lunge. Brother Joe's phone rings regularly now. Ted has the always dangerous "muskie" fever!—**District Warden Normal Ely** (Erie).

#

Members of the West Chester Fish and Game Association were interested to note **District Warden Horace Pyle** recently stocked the Brandywine Creek with smallmouth bass and introduced a stocking of muskellunge, a new species for the "Brandy."

#

During the month of September several large legal muskies were taken from Gordon Lake (Bedford). Raymond Walzlko, Johnstown, Pa., caught one 36½ inches long, weighed estimated 10-11 pounds.—**District Warden William McIlroy** (Bedford).

#

The Juniata River and tribs had best fishing this season since anyone can remember. Out of one of the Newton Hamilton hot spots, Willis Linn, of Newton Hamilton, Pa., took several 16- to 18-inch smallmouth bass.—**District Warden Richard Owens** (Huntingdon-Mifflin).

McConnell's Mill to Get Face Lifting

Rehabilitation of famed McConnell's Mill, a spot well known to west state anglers, is on way to becoming a reality when \$124,476 was made available in the capital budget bill of the General Assembly. Another sum of \$90,000 was provided for roads and other park improvements. Department of Forests and Waters is expected to get an early start on the face lifting at McConnell's Mill State Park.

Meet Your Commissioners



JOSEPH M. CRITCHFIELD, Confluence, Pa., has always had the outdoors in his blood. He was only 12 years old when he joined the Wildlife League of Pennsylvania, decided to join the fight with other Pennsylvania conservationists in an effort to stem the ebbing tide of fish, game in the Commonwealth. Many of his plans were interrupted by World War I; served with the 321st Field Artillery, Battery A.

Returning from the battlefields he again took up the fight for wildlife he was forced to abandon two years before, helped organize the Turkeyfoot Game and Fish Assn., served as its president for 25 years. Aided in forming the Somerset County Sportsmen's League, the Southwest Division, Penna. Federation of Sportsmen's Clubs and, along with Glenn Hollowood, of Donora, Pa., and Ross Leffler, are the only living delegates, organizers of the division.

Mr. Critchfield was first appointed to the Fish Commission in 1940 by Governor James. He was again appointed a member of the Commission by Governor Leader to serve until January, 1958; then reappointed by Governor Lawrence to serve until January, 1966.

He is married to the former Anna Belle Blubaugh; they have four children, three boys, one girl. Retired from the U. S. Post Office Dept. in 1955 at age 61. His advice to any person is to retire as quickly as possible after 60, but not sit around doing little or nothing. Immediately get busy doing things you always dreamed of doing when you had no time, then enjoy life. His activities with the Commission, the sportsmen of Pennsylvania, absorb much of his time but he enjoys every minute of it.

The little boy stood admiring the stars. "Gee," he exclaimed, "if Heaven is that beautiful on the bottom, think how it must be on the other side."



Youth Outdoors

Ambassadors of Conservation

By MYRON E. SHOEMAKER

This page is for outdoor youngsters, the future "Ambassadors of Conservation." However, you adults are welcome to nibble at it now and then . . . if you like it. In fact, we hope you do. And if you do, you may be able to help your young contemporaries digest some of it.

We shall at all times try to use simple words, simple sentences. First, because simplicity is the shortest route to understanding. Second, because if children can understand simplicity, adults can, too.

There will no doubt be times, however, when words and terms in words are not fully clear to the youngster. When this is involved, we will try to clarify the full meaning, and trust you adults to lend a helping hand.

Before we get into a diet of words, may we explain (1) the purpose of this monthly page; and (2) the title.

The purpose is to help the young outdoorsmen with their outdoor problems, to meet them on the same level of interest, then work together to help them develop backgrounds of self reliance in their outdoor interests when they become adults.

Ambassadors of Conservation: An ambassador is the highest ranking diplomat between governments. They help governments solve problems. Thus, an Ambassador of Conservation may become the highest ranking diplomat between the forces of society and the forces of nature.

The forces of society include all the members of society: men, women and children in city, town and countryside. No matter whether they fish or hunt, like the outdoors in general, or just enjoy living, they are a vital part of the whole scheme of things that nature set up in the beginning for the well-being of man.

The forces of nature include all the members of nature, every living and growing thing: fish, game, trees, shrubs, flowers, grass, soil, water, wind, rain, sunshine, fresh air and anything else that nature provides for the general well-being of mankind.

Today these two forces must work together. And we trust the material on this page will smooth the way to a clearer understanding of how people and nature can work together.

What about Pennsylvania's future? It's your future, too. And, the future of all of us involves many things in conservation and conservation education.

First, what is conservation?

It does not mean just the stocking of fish and game to catch and kill. It is the protection, preservation and wise use of all natural resources from which we derive our food, clothing, shelter and wholesome recreation.

What is conservation education?

It is a "debt" long past due the children of Pennsylvania and the nation, a debt of which neither the interest nor principal has been paid.

Things you may not know: This will be featured monthly.

Soil is the basic foundation of civilization.

Water is equally important. Conservation protects these foundations.

Conservation, in the strictest sense of the word is "Land Management." Remember this term "*land management*." It will mean a lot to you in the years ahead.

Soil that is washed into our waterways destroys not only vegetation on the bed of a stream, but destroys the spawn of many kinds of fish.

Soil belongs on the land, not in the water.

Sound land management will keep the soil where it belongs at all times.

Each month, for a time at least, there will be a box insert. Through a box insert included from time to time we hope you will let us know the things that are of interest to you. You write and tell us. We will cover the subject for you and all of your outdoor friends.

Any specific questions you may want answered direct, may we suggest that you write us in care of the PENNSYLVANIA ANGLER. Lack of space prevents us from answering your questions on this page. Answers will be by direct mail. If, however, the question is of importance to all Junior Outdoorsmen, the matter will be covered on this page.

Lots of fun, Junior Outdoorsmen. And remember this:

If you are good to nature, nature will be good to you.



PENNSYLVANIA ANGLER



—C. Paul Blair photo

OFFICERS ELECTED 1961-1962 Pennsylvania Federation of Sportsmen's Clubs: left-right, first row—Thomas Levering, corresponding secretary; Henry Warner, 2nd vice president; Everett G. Henderson, president; Dr. Alvin R. Grove, 1st vice president. Second row—Oscar A. Becker, honorary president; James F. G. Sheffer, alternate delegate, N.W.F.; Seth L. Myers, delegate, N.W.F.; C. Edward Palmer, treasurer; C. Paul Blair, recording secretary.



NEW OFFICERS elected by Pennsylvania Outdoor Writers Association at their annual business meeting recently are, left to right, sitting: Keith Schuyler, Berwick, Director; Willard T. Johns, Hershey, President; Roger M. Latham, Pittsburgh, 1st Vice President; LeRoy F. Manning, Prospect Park, Treasurer. Standing: David E. Fisher, Allentown, Secretary-Editor; Mark Passaro, Allentown, 2nd Vice President; Myron Shoemaker, Laceyville, Director; Paul Blair, Sharon, Director; Bob Parlamen, Franklin, Director; Harry Allaman, York, Director.

West Chester Club's Rodeo Has Good Turnout

Despite rain, 126 youngsters turned out for the 11th Annual Fishing Rodeo held by the West Chester Fish & Game Association, Inc., at Russel Jones' Pond recently. Prizes were awarded to boys and girls catching the largest fish. In the bass division, Robert Bartholomeu, of Thornbury, caught a 14½-incher. Maureen McLean, Malvern, caught a 12-inch bass. In bluegill division, Bill Bodulich, Green Hill, took honors with one 8¼-incher; Elaine Crouder, West Chester, had a 7-inch bluegill. Other prizes for fish were awarded to Steve Anderson, Betty Lou Williams, Maurice Fennimore, Wayne Williams, Ken Brown, Carol Reese, Bill Price, Addie Harrison, Phil Baker, Benny Forte, Linda Stahl and Palmer Hickman. Chairman of the event was Charlie Address.

Wildflower Reserve Acquired

Preservation of one of the finest known wildflower areas in Western Pennsylvania, totaling more than 300 acres, has been assured by the purchase by Western Pennsylvania Conservancy of two adjoining tracts of land on both sides of U. S. Highway 30, adjacent to Raccoon Creek State Park, in Beaver County.

Funds for the development of trails and other facilities and the restoration of two buildings on the site will be sought in the immediate future. It is hoped work may begin on protective measures for the reserve, and for making it accessible for approved uses, in the spring of 1962.



MEADVILLE SPORTSMAN'S CLUB wildlife exhibit at the recent Crawford County Fair. Approximately 50,000 persons visited the exhibit. Club secretary, Anthony J. Thomas, thanked the Fish Commission for active help from Commission personnel in distributing pamphlets; books, conservation literature.



The Editor's Angle

Dear Editor:

Some critics say there are no fish in Pennsylvania waters and I want to refute this. On Saturday, September 16, 1961, I caught a 22¾-inch, 6-lb. largemouth bass; on Saturday, September 23, last, I caught a 25-inch pickerel fishing from a boat in Peck's Pond (Pike). I have taken 18-, 19- and 19½-inch bass from this same lake other fellows say is "all fished out!"

I have pictures to prove my catches and can forward them for inspection. I hope this is of interest to you and "especially" to those who complain there are "NO FISH IN PENNSYLVANIA WATERS." I am a subscriber to the ANGLER, have been for many, many years, enjoy it very much . . . yes, every line!

Wilson Charles
Perkasie, Pa.

We'll take your word for those big fish, Mr. Charles, because we receive many fine reports of catches. We appreciated getting yours.

Dear Editor:

One morning I fished Beach Lake in Wayne County, using a small jitterbug, 8-lb.-test line, spinning outfit. A largemouth bass hit, took to the air and on way down something grabbed him, took off across the lake. I patiently gave whatever it was about 10 minutes to swallow the largemouth and I hooked it. I never gained one inch of line, it took all I had and when the end was reached I just hung on. About 60 yards out he rose, snapped the line. It was a smallmouth bass, the proportions of which nobody will believe. I cannot judge this monster but he was at least 9 pounds but much closer to 15. I found the badly mutilated largemouth floating near the battle scene. He still had a little life in him and he measured 12½ inches.

William Kozlansky
Scranton, Pa.

JIM LOCKHART, of Linesville, Pa., was fishing out of his boat near Tuttle's Point, Pymatuning, in about 10 feet of water. He saw something floundering around in the water, thought it was a beaver but on second look turned out to be a fox squirrel fighting for its life. Lockhart netted the animal, took it to shore, and waited for it to revive. He tried to leave the squirrel several times but it stuck close to him. After about 45 minutes it finally darted away. No explanation for how the squirrel got into water way over its head.

* * *

Thomas Murray, Sr., Hawley, Pa., reports good fishing in Shohola Creek (Pike) last trout season. One catch of rainbows ranged from 16 to 23½ inches, weighed a total of 18¾ pounds.

* * *

Outdoor sketch . . . said the minister just before the responsive reading, "Will the lady who always arrives at the 'still waters' while the rest of us are still in the 'green pastures' please wait for us this time."



—Penna. Fish Commission photo by Glenn Hoy

FIRST LEGAL MUSKY from Bald Eagle Creek. Lucky Michael Pinnin, Unionville, Pa., is being congratulated by District Warden Paul Antolosky (Centre) for catching first legal size musky in the Bald Eagle, vicinity of Howard. The big fish measured 35 inches, weighed 11½ pounds, taken on a minnow. Scale sample indicated fish was from fingerling stocking several years ago by the Pennsylvania Fish Commission. Pinnin, 68, declares the thrill of the strike, the hour-long battle far surpassed any other experience he had in more than 50 years of angling.



BIG SNAPPER . . . it took 90 minutes for Arthur Rowe, 75, of Reading, Pa., R. D. 2, to land this ugly customer, with the aid of his nephew, Bruce Huie, of Adamstown, from Brandywine Creek, near Guthriesville, Chester County. Shell was 23 inches long, 19 inches wide; largest Rowe has caught in 45 years. He uses a probing stick to locate turtles in bottom, maneuvers them into position by teasing, then grabs them by tail or rear feet. Mr. Snapper was on way to its destiny in the soup for an upcoming outing last time we heard.



Frog Goes Whole Hog

By BRYCE CARNELL

Fish Commission photo by Johnny Nicklas

A giant bullfrog was found dead recently in a Caledonia area pond, the apparent victim of his king-sized appetite.

With eyes larger than his stomach, the bullfrog apparently attempted to swallow a half-grown Muscovy duck and died in the attempt, according to Hollis Dick, gift shop proprietor of the Caledonia area. The frog and the duck were found floating on the surface of the pond, the head and neck of the duck deep in the frog's throat.

The discovery was made by Dick, who said the frog and duck were found floating on the water of a pond adjacent to his gift shop.

Bryce Carnell, fish warden, said a check with the State Fish and Game Commissions at Harrisburg failed to show a similar occurrence on record.

The frog and duck, as they were taken from the pond by Dick, were displayed at the sportsmen's fair at the Chambersburg Rod & Gun Club along the Warm Spring Road.

In outdoor recreation, as in other things, we have been so anxious to give our children what we didn't have that we have neglected to give them what we did have.



—Photo by Ray Schaefer, Jersey Shore, Pa.

BALD EAGLE AGAIN hit headlines in local newspapers when Carroll Ashburn (left) and Chester L. Quiggle, both of Lock Haven, landed two lunker muskies from the stream within 15 minutes. Ashburn's fish measured an even yard, weighed 12½ pounds; Quiggle's prize taped 41 inches, weighed 15½ pounds. District Warden Lloyd Wilson noted the left pectoral fin on each fish had been clipped, said the big muskies were among some 700 fish stocked in the first Bald Eagle planting in 1956.

Dear Sir:

On June 21, 1927, my father, Elmer Weston, and his brother, John Weston, found a common land turtle and carved their initials and date on its belly, then let him go. On September 24, 1961, I went for a walk near my home and found this turtle. Between the time my dad and his brother carved their initials and date, and the time I found him, someone else had carved the initials B.H. with the date Sept. 17 (?), the year indistinct. I took the turtle home to Dad who said . . . "Well I'll be darned." I then returned the turtle, now over 34 years old, to its stamping grounds.

Lois Weston
Tyrone, Pa.

Maybe if we all moved a little slower, we'd be around longer.

Last Ditch Catch Wins Susquehanna Bass Derby

The Susquehanna Bass Derby concluded in dramatic fashion Labor Day, when Bruce Arrowood, of Mehoopany, landed a huge 5 lb. 8 oz. smallmouth bass to finish far in front of his nearest rival, Barnard Kozek, of West Pittston.

Mr. Arrowood, who was languishing in fourth place in the standings as the final day's fishing began, stands to collect \$125 as the first prize in the first bass derby to be conducted by the Tunkhannock Sportsmen's Club.

The prize-winning fish was 10 ounces heavier than Mr. Kozek's second-place specimen which earned him \$50. Due to collect third-prize money of \$25 is Gregson Amos, of Edwardsville, 4 lb. 10 oz.; with James Thomas, of Trucksville, due for the \$10 fourth prize, at 4 lb. 4 ounces.

The conclusion of the bass derby brings to close an entire summer of Susquehanna fishing promotion sponsored by the local sportsmen's club. Backed by regional businessmen, the program began with the first carp derby to be conducted in this area.

"THERE'S STILL TIME, FOLKS!"



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